Intermittent Preventive Treatment during Pregnancy and Antenatal Care in Practice:
A study from the Kilombero Valley, Tanzania

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Prof. Dr. Martin Spiess

Dekan

Dedicated to my dear family

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ABC   Azithromycin-based combinations

ALu   Artemether Lumefantrine

ANC   Antenatal care

CHMT   Council Health Management Team

CSDH   Commission for Social Determinants of Health

CHF   Community Health Fund

DfID   Department for International Development

DHS   Demographic and Health Survey

DMO   District Medical Officer

DSS   Demographic Surveillance System

EIR   Entomological Inoculation Rate

FANC   Focused Antenatal Care

FGD   Focus Group Discussion

HERA   Health Research for Action

HIV/AIDS   Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome

HMIS   Health Management Information System

IHI   Ifakara Health Institute

IHRDC   Ifakara Health Research and Development Centre

IMCI   Integrated Management of Childhood Illness

KFPE   Commission for Research Partnerships in Developing Countries

LLIN   Long-lasting insecticidal nets

IPTp   Intermittent preventive treatment during pregnancy

IQR   Interquartile Range

ISTp   Intermittent screening and treatment in pregnancy

ITN   Insecticide Treated Net

MCH   Mother and Child Health

MDG   Millennium Development Goal

MIPESA   Malaria in pregnancy East and Southern Africa Coalition

MoH   Ministry of Health

MoHSW   Ministry of Health and Social Welfare

MSD   Medical Stores Department

NBS   National Bureau of Statistics

NFSD	Novartis Foundation for Sustainable Development
NIMR	National Institute for Medical Research
NMCP	National Malaria Control Program
PIOP	Policies, Institutions, Organizations and Processes
PMTCT	Preventing Mother to Child Transmission
RBM	Roll Back Malaria
RCH	Reproductive and Child Health
RDT	Rapid Diagnostic Tests
SD	Standard Deviation
SES	Socio-Economic Status
SP	Sulphadoxine-Pyrimethamine
STI	Swiss Tropical Institute
STPH	Swiss Tropical and Public Health Institute
TACAIDS	Tanzanian Commission for AIDS
TAZARA	Tanzania Zambia Railway
TBA	Traditional Birth Attendant
THDS	Tanzania Health and Demographic Survey
THMIS	Tanzania HIV and Malaria Indicator Survey
TNVS	Tanzania National Voucher Scheme
UK	United Kingdom
UN	United Nations
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
WHO	World Health Organisation
ZAC	Zanzibar AIDS Commission

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Summary

Each year an estimated 125 million pregnant women are at risk of getting infected with malaria in areas with *P. falciparum and P. vivax* transmission. In Tanzania, approximately 1.7 million pregnant women contract malaria each year leading to a high prevalence of maternal morbidity, maternal mortality and adverse birth outcomes.

The World Health Organization (WHO) recommends for sub-Saharan Africa a package of prompt and effective case-management combined with the delivery of insecticide-treated nets (ITN) and intermittent preventive treatment during pregnancy (IPTp) with sulphadoxine-pyrimethamine (SP) through the national antenatal care (ANC) programs. Implemented in Tanzania around 2001, uptake of IPTp has been particularly low after changing the first line treatment for malaria from SP to Artemether Lumefantrine (ALu) in 2006. However, coverage levels have continued to be poor up to date with less then 30% of pregnant women receiving a full course of two SP doses.

The aim of this thesis was to contribute to a better understanding of women's access to and use of IPTp and other ANC services in the Kilombero Valley, Tanzania. In order to explain low IPTp coverage levels, factors influencing ANC utilization on the demand side and the quality of ANC on the supply side were investigated. Drawing on conceptualizations of scholars from the "New Institutionalism" this thesis sought to provide a more in-depth understanding of 1) how rules, regulations and guidelines at the health system level influence health providers' implementation of health policies and guidelines concerning IPTp and ANC and 2) how old and new norms and values at the household level and beyond influence women's access to and use of ANC and IPTp services.

The study was conducted in close collaboration with the ACCESS Programme and was carried out in the Demographic and Surveillance System (DSS) area of the Kilombero and Ulanga district in south-eastern Tanzania. Research was conducted in three phases between April 2007 and June 2009 and combined a set of qualitative and quantitative methods for data collection.

Our findings revealed a high coverage level of the first IPTp dose (79%) but confirmed a low uptake of the second one with only 27% of pregnant women having received two SP doses. Although 71% of all women started ANC after the four gestational months recommended by

guidelines, their late attendance was not found to be the main constraint for IPTp delivery since 81% of the women had attended the ANC clinic at the time of the first IPTp delivery and 60% had attended both during the first and the second IPTp delivery period. The observation that among these women only 73% actually received one dose and only 29% received two doses of IPTp, pointed to the high number of missed opportunities. Low coverage levels for the second IPTp dose could be explained by health workers delivering IPTp to significantly less women during the second IPTp delivery period than the first one (55% vs. 73%) despite their high knowledge about the IPTp policy.

Apart from women's late ANC initiation, it appeared that the majority of pregnant women respected the ANC schedule. However, it seemed that women's attendance was rather based on norms and rituals than on their awareness of the benefits of ANC services for their own and their child's health. Late ANC initiation was associated with belonging to the Sukuma ethnic group, multiparity, and late recognition of pregnancy. Early ANC attendance, on the other hand, was triggered by primiparity, experience of a previous reproductive loss and feeling supported by the partner or husband. Male's support during pregnancy appeared to be facilitated and constrained by a broad range of institutions working along the lines of gender, family and kinship. On the other hand new norms and values imposed by the legal system or the 'modern' health system were identified as being influential on men's support during the prenatal period.

Case studies in four health facilities revealed that the quality of ANC care was generally poor. Among a sample of 36 observed ANC consultations, 12 of the services recommended by the FANC guidelines were not given to any women, a further 18 services were given to 3%-58% and eight services were given to over 80% of women. Performance during return visits was found to be particularly poor. Instead of ANC guidelines, health workers rather complied to ANC cards; analysis showed that health services for which information was required on the ANC card were delivered far better than services not listed on the ANC card but recommended by the FANC guidelines. Moreover, dichotomous IPTp schedules in the guidelines for ANC and malaria resulted in health workers' continued delivery of IPTp according to restrictive IPTp schedules despite the existence of a more simplified IPTp schedule recommended by WHO. Calculations showed that the effective implementation of the latter guidelines could potentially increase IPTp coverage by up to 20 percentage points, which urgently calls for a revision of the national IPTp guidelines. Besides health policy factors, health care practices were found to be clearly shaped by health providers' difficult

working conditions. In order to cope with constraints caused by lack of trained staff, resource shortages and a high demand for their services, health workers appeared to adopt informal rules and routines such as attendance and diagnostics schedules and routines that allowed for mass treatment such as health education and counselling in groups.

In order to better understand how the availability of material and human resources and health workers' access to them influence health service delivery and its quality, this thesis proposed and applied the concept of "workhood" as a new analytical device. By introducing an actors-perspective to the health system, the concept allowed light to be shed on the limitations and potentials of health workers' capabilities. While the availability of many items such as drugs, supplies and infrastructure were found to be determined by forces that went beyond health workers' control, health workers appeared to be able to mobilize social, cultural and symbolic resources to bridge structural holes and foster positive health outcomes in communities.

More research is needed in order to validate and strengthen some of these findings. In conclusion, this thesis stressed the need for a comprehensive approach to improve pregnant women's access to and use of IPTp and other ANC services. On the health policy level, the simplified IPTp schedule recommended by WHO should be fully implemented and disseminated through clear messages to health workers in order to benefit quickly from higher IPTp coverage levels. At the health system level, pregnant women's access to IPTp and other ANC services should be improved through the use of updated ANC cards as job aids and through efforts to improve quality of care, outreach services and health education messages. Additionally, experienced auxiliary nurses should receive training to compensate for the low output of new well-trained personal. At the community level, established communication channels such as the media and male and female community volunteers should be used – but also potential new communication strategies such as the use of mobile phones for health promotion should be tested – to reach not only women but also men with information about the benefits of early and frequent ANC attendance, health facility delivery and postnatal care in order to enhance their awareness about the services offered within these components and their ability to actively demand them.

Zusammenfassung

Schätzungsweise 125 Millionen Frauen, die in Regionen mit P. falciparum und P. vivax Transmission leben, sind jedes Jahr dem Risiko ausgesetzt, sich mit Malaria zu infizieren. In Tansania, erkranken jedes Jahr rund 1.7 Millionen schwangere Frauen an Malaria. Dies führt zu einer hohen Krankheits- und Sterblichkeitsrate unter den Frauen wie auch unter den Neugeborenen.

Die Weltgesundheitsorganisation (WHO) empfiehlt in afrikanischen Ländern südlich der Sahara eine Kombination von drei Interventionen: die umgehende und effektive Behandlung von Malariafällen, die Abgabe von behandelten Moskitonetzen und die Einnahme von Sulphadoxine-Pyrimethamine (SP) als Malariaprophylaxe. All diese Interventionen sollten innerhalb der Schwangerschaftsvorsorge abgegeben werden. Die Malariaprophylaxe wurde in Tansania bereits im Jahr 2001 eingeführt. Im Jahr 2006, wurde deren Abgabe jedoch vom Wechsel des nationalen Malariamedikaments von SP zu Artemether Lumefantrine (Alu) beeinträchtigt. Seitdem liegt der Anteil der Frauen, die, wie vorgesehen, zwei SP Dosen erhalten unter 30%.

Diese Dissertation zielt darauf ab, besser zu verstehen, wie Frauen im Kilombero Tal in Tansania Zugang zur Malariaprophylaxe und zur Schwangerschaftsvorsorge haben, und wie sie diese Gesundheitsleistungen nutzen. Um die niedere Rate der Einnahme von zwei Malariaprophylaxen-Dosen zu erklären, wurden Faktoren untersucht, die einerseits die Nutzung der Schwangerschaftsvorsorge auf der Nachfrageseite und andererseits die Dienstleistungsqualität auf der Angebotsseite beeinflussen. Konzeptionell beziehen wir uns auf Ideen des „Neuen Institutionalismus". Wir versuchen damit zu erklären, wie 1) Regeln, Regulationen und Richtlinien des Gesundheitssystems sich auf die Umsetzung der Gesundheitspolitik und der Richtlinien durch das Gesundheitspersonal auswirken, und 2) wie alte und neue Normen und Regeln auf der Haushaltsebene und anderen gesellschaftlichen Ebenen den Zugang und die Nutzung der Frauen von Malariaprophylaxe und der Schwangerschaftsvorsorge beeinflussen.

Durchgeführt wurde die Studie im Gebiet des Demografischen Kontrollsystems des Kilombero und Ulanga Distrikts im südöstlichen Tansania, in enger Zusammenarbeit mit dem Access Programm. Für die Datenerhebung, die in drei Phasen zwischen April 2007 und Juni

2009 stattfand, wurde eine Kombination von qualitativen und quantitativen Methoden verwendet.

Unsere Resultate weisen darauf hin, dass 79% aller Frauen eine erste Dosis der Malariaprophylaxe erhielten, aber nur 27% aller Frauen von einer zweiten SP Dosis profitierten. 71% aller Frauen begannen ihre Schwangerschaftsvorsorge nach dem empfohlenen vierten Schwangerschaftsmonat. Der späte Beginn der Geburtsvorsorge stellte jedoch nicht den Hauptgrund für die niedere Malariaprophylaxenrate unter Schwangeren dar. 81% aller Frauen hatten die Schwangerschaftsvorsorge während des ersten Zeitfensters der Malariaprophylaxen-Abgabe besucht; und 60% besuchten die Klinik sowohl während der ersten als auch der zweiten Abgabe-Periode. Die Erkenntnis, dass nur 73% dieser Frauen eine erste Dosis und nur 29% eine zweite Dosis erhielten, zeigt auf, dass die Möglichkeiten zur Abgabe der Malariaprophylaxe zuwenig genutzt wurden. Die geringe Zahl an Frauen, die eine zweite Dosis erhielten, konnten damit erklärt werden, dass das Gesundheitspersonal trotzt guter Kenntnisse der Richtlinien, die Malariaprophylaxe vor allem während der zweiten Abgabe-Periode an sehr viel weniger Frauen verabreichte als während der ersten Periode (55% vs. 73%).

Wenige Frauen schienen sich des Nutzens der Geburtsvorsorge für die eigene Gesundheit und die des Kindes bewusst zu sein. Stattdessen schien die Mehrheit der Frauen der Geburtsvorsorge aufgrund von Normen und Routinen nachzukommen. Ein später Beginn mit der Geburtsvorsorge war mit der Zugehörigkeit zur ethnischen Gruppe der Sukuma, mit Multiparität, mit der Einschätzung, dass die Servicequalität schlecht sei, und mit der späten Erkennung der Schwangerschaft assoziiert. Eine frühe Nutzung der Geburtsvorsorge war mit Primiparität, mit einer früheren Fehlgeburt, und mit dem Gefühl, von dem eigenen Partner oder Ehemann unterstützt zu werden, verbunden. Ob Männer ihre Partnerinnen während der Schwangerschaft unterstützten, wurde einerseits von verschiedene Institutionen, die entlang von Geschlechterrollen, Familie und Verwandtschaft wirken, beeinflusst, anderseits aber auch von „neue" Normen und Werten des Rechtssystem und des „modernen" Gesundheitssystems.

Fallstudien, die in vier Gesundheitszentren durchgeführt wurden, deuteten auf eine schlechte Qualität der Schwangerschaftsvorsorge hin. Innerhalb von 36 Schwangerschafts-Konsultationen wurde beobachtet, welche der 38 Gesundheitsdienstleistungen, die von den Richtlinien der Schwangerschaftsvorsorge vorgeschrieben werden, den Frauen angeboten

wurden. Die Resultate zeigten, dass 12 Dienstleistungen überhaupt nicht verabreicht wurden, 18 Dienstleistungen wurden an 3%-58% der Frauen abgegeben, und nur gerade acht Dienstleistungen wurden über 80% der Frauen angeboten. Nachfolge-Untersuchungen der Schwangerschaftsvorsorge zeichneten sich durch besonders schlechte Qualität aus. Anstatt sich an die nationalen Richtlinien zu halten, befolgte das Gesundheitspersonal die Instruktionen der Registrierungskarten, die während der Schwangerschaftsvorsorge verwendet werden. Eine Analyse zeigt auf, dass diejenigen Gesundheitsdienstleistungen, die auf den Karten verzeichnet sind, besser abgegeben wurden als diejenigen, die zwar in den Richtlinien vorgegeben sind, aber nicht auf den Karten aufgeführt werden. Instruktionen für die Abgabe der Malariaprophylaxe innerhalb der Schwangerschaftsvorsorge- und Malaria-Richtlinien sind unklar und veraltet. Dies führte dazu, dass das Gesundheitspersonal die Malariaprophylaxe weiterhin in alter Weise abgab, obwohl die WHO inzwischen neue Instruktionen empfiehlt. Berechnungen zeigten auf, dass eine effiziente Implementierung der neuen Richtlinien dazu führen würde, dass bis zu 20% mehr Frauen eine zweite Malariaprophylaxen Dosis erhalten könnten. Dieses Resultat weist klar auf die Dringlichkeit des Policy-Wechsels hin. Neben gesundheitspolitischen Aspekten hatten jedoch auch schwierige Arbeitsbedingungen einen Einfluss auf die Praktiken des Gesundheitspersonals. Um mit Engpässen an ausgebildetem Personal und materiellen Ressourcen und einer gleichzeitig hohen Zahl an Klientinnen und Patienten umzugehen, schien das Gesundheitspersonal informelle Regeln und Routinen zu entwickeln. Diese beinhalteten beispielsweise, dass Schwangere nur an spezifischen Tagen zur ersten Untersuchung der Schwangerschaftsvorsorge kommen durften, oder Diagnosetests erhielten, aber auch, dass gesundheitliche Aufklärung, Bildung und Beratung in Gruppen stattfanden anstatt in individuellen Gesprächen.

Es ist ein Anliegen dieser Dissertation, besser zu verstehen, wie sich die Verfügbarkeit von materiellen und personellen Mitteln und der Zugang des Gesundheitspersonals zu diesen auf die Dienstleistungserbringung und ihre Qualität auswirken. Dazu wurde das Konzept „Workhood" als neues analytisches Werkzeug vorgeschlagen und getestet. Mit seiner akteurszentrierten Perspektive auf das Gesundheitssystem erlaubt das Konzept, die Grenzen und Potentiale des Gesundheitspersonals zu untersuchen. Es zeigte auf, dass Engpässe bezüglich Medikamente, Instrumente und anderer Infrastruktur oft ausserhalb der Möglichkeiten des Gesundheitspersonals lagen. Andererseits schien das Gesundheitspersonal in gewissen Fällen fähig zu sein, soziale, kulturelle und symbolische

Ressourcen zu mobilisieren, um Engpässe zu überbrücken, und so eine positive Wirkung für die Gesundheit in den Gemeinden zu erzielen.

Mehr Forschung ist nötig, um einige der Resultate dieser Forschung zu bestätigen und zu bestärken. Zusammenfassend kann gesagt werden, dass diese Dissertation aufgezeigt hat, dass ein ganzheitlicher Ansatz notwendig ist, um den Zugang zu Malariaprophylaxe und zur Schwangerschaftsvorsorge und deren Nutzung unter schwangeren Frauen zu verbessern. Im gesundheitspolitischen Bereich sollten die vereinfachten Richtlinien der Malariaprophylaxe, die von der WHO empfohlen werden, klar kommuniziert und umgesetzt werden. Auf der Ebene des Gesundheitssystems sollte die Qualität der Schwangerschaftsvorsorge und Malariaprophylaxe verbessert werden. Dafür sind mehrere Massnahmen nötig: die Überarbeitung der Registrierungskarten und deren Verwendung als Hilfsmittel innerhalb der Schwangerschaftsvorsorge, die regelmässige Durchführung der Dorfbesuche zur medizinischen Versorgung (outreach services) und die Verbesserung der gesundheitlichen Aufklärung und Beratung in den Gesundheitsposten. Ausserdem sollte erfahrenes Hilfspersonal geschult werden, um die Engpässe in der Ausbildung von neuem gut ausgebildetem Personal zu kompensieren. Auf Gemeindeebene, sollten etablierte Kommunikationskanäle wie Medien und Gemeindearbeiter – weibliche wie auch männliche – genutzt werden. Potentielle neue Strategien wie die Verwendung von Mobiltelefonen zur Gesundheitsförderung sollten ebenfalls getestet werden, um Frauen wie auch Männern Informationen über den Nutzen einer frühzeitigen und häufigen Schwangerschaftsvorsorge, einer Geburt im Gesundheitszentrum und einer Nachsorge nach der Geburt zukommen zu lassen. Nur so kann das Bewusstsein von Frauen und Männern für den Nutzen der Gesundheitsleistungen, die innerhalb dieser Komponenten angebotenen werden, erhöht und ihre Fähigkeit verbessert werden, diese Dienstleistungen aktiv nachzufragen.

Muhtasari

Kila mwaka wanawake wajawazito milioni 125 wanakadiriwa kuwa katika hatari ya kuambukizwa ugonjwa wa malaria katika maeneo yenye maambukizi ya vimelea vya P. falciparum na P. vivax. Nchini Tanzania, takriban wanawake wajawazito milioni 1.7 wanaugua malaria kila mwaka, hali inayosababisha idadi kubwa ya wagonjwa na vifo vya akina mama wajawazito na matokeo ya uzazi yasiyoridhisha.

Shirika la Afya Duniani (WHO) limependekeza kwa nchi zilizo chini ya jangwa la sahara kupitia mpango wa kitaifa wa huduma kwa wajawazito kifurushi cha huduma kinachojumuisha tiba sahihi ya malaria inayotolewa kwa wakati, utoaji wa vyandarua vyenye viuatilifu pamoja na utoaji wa dawa aina ya SP kwa ajili ya kinga ya malaria wakati wa ujauzito (IPTp). Ingawa utekelezaji wa mpango huu ulianza mwaka 2001, utumiaji wa kinga hii umeendelea kuwa chini hasa baada ya kubadilisha tiba ya mwanzo ya ugonjwa wa malaria kutoka SP na kuanza kutumia Artemether Lumefantrine (ALu) mnamo mwaka 2006. Hata hivyo, kiwango cha utumiaji wa kinga hiyo umeendelea kuwa hafifu hadi leo, ambapo asilimia chini ya 30 ya wanawake wajawazito wanapata kinga kamili ya dozi mbili za SP.

Madhumuni ya utafiti huu yalikuwa kuchangia na kuongeza uelewa wa upatikanaji na utumiaji wa IPTp na huduma nyingine za kliniki ya wanawake wajawazito katika Bonde la Kilombero, Tanzania. Ili kuweza kuelezea kiwango cha chini cha utumiaji wa IPTp, uchunguzi ulifanyika kuangalia mambo yanayochangia utumiaji wa kliniki ya wajawazito (ANC) kwa upande wa mahitaji na ubora wa huduma za ANC kwa upande wa utoaji huduma. Kwa kutumia mawazo ya maudhui ya wataalam kutoka kwenye "New Institutionalism", tasnifu ya utafiti huu ni kutoa uelewa wa kina kuhusu 1) jinsi taratibu, kanuni na miongozo katika mfumo wa afya inavyosababisha watoa huduma kutekeleza sera na miongozo ya afya inayohusu IPTp na ANC, na 2) jinsi ambavyo taratibu za zamani na mpya na mambo yanayothaminiwa katika ngazi ya kaya yanavyopelekea utumiaji wa huduma za ANC na IPTp.

Utafiti huu ulifanyika kwa ushirikiano wa karibu na programu ya ACCESS na kutekelezwa katika eneo lenye mfumo wa kufuatilia taarifa za maisha ya kila siku ya wakazi wa eneo hilo (DSS) la Wilaya za Kilombero na Ulanga kusini mashariki mwa Tanzania. Utafiti ulifanyika kwa awamu tatu kati ya mwezi Aprili 2007 na Juni 2009 na ulijumuisha mbinu mbalimbali (mahojiano ya maelezo na tarakimu) za ukusanyaji wa taarifa.

Matokeo ya utafiti yalibaini kiwango cha juu cha utumiaji wa dozi ya kwanza ya IPTp (79%) lakini yamethibitisha kuwepo kwa kiwango cha chini cha utumiaji wa dozi ya pili, ambapo 27% tu ya wanawake wajawazito ndiyo waliokuwa wamepata dozi zote mbili za SP. Ingawa 71% ya wanawake walianza kliniki baada ya miezi minne ya mimba/ujauzito inayopendekezwa kwenye mwongozo, kuchelewa kwao kuanza kliniki hakikuwa kikwazo cha kupata IPTp kwa kuwa 81% ya wanawake walikuwa wamehudhuria kliniki kipindi cha utoaji wa dozi ya kwanza, na 60% walikuwa wamehudhuria vipindi vyote vya utoaji wa dozi ya kwanza na ya pili. Hali hii inayooonesha kwamba kati ya wanawake hawa ni 73% walipata dozi moja na 29% tu walipata dozi mbili za IPTp, inaashiria upoteaji wa fursa nyingi kwa akina mama. Kiwango cha chini cha upatikanaji wa dozi ya pili ya IPTp inaelekea kusababishwa na wafanyakazi wa afya kutoa dawa kwa wajawazito wachache zaidi kipindi cha utoaji wa dozi ya pili ukilinganisha na kipindi cha dozi ya kwanza (55% vs. 73%), licha ya kuwa na ufahamu wa kutosha kuhusu sera ya IPTp.

Pamoja na wanawake kuchelewa kuanza kliniki, ilionekana kwamba wengi wao walikuwa wanafuata ratiba ya kliniki. Hata hivyo, ilionekana kuwa kuhudhuria kwa wanawake kliniki kulitokana na taratibu na mazoea ya kawaida kuliko uelewa wa manufaa ya huduma za ANC kwa afya zao na watoto wao. Kuchelewa kuanza kliniki ilihusishwa na kutokea katika kabila la wasukuma, kuzaa mara nyingi, fikra za huduma duni za afya na kuchelewa kutambua ujauzito. Kwa upande mwingine, wanawake kuwahi kuhudhuria kliniki ilisababishwa na kuwa mjamzito mara ya kwanza, kuwahi kupoteza mimba/mtoto na kujisikia kuungwa mkono na wenza wao. Kuungwa mkono na wanaume wakati wa ujauzito ilionekana kuchangiwa na mambo mengi tofauti yanayojikita katika masuala ya jinsia, familia na ukoo. Kwa upande mwingine, taratibu mpya zinazowekwa na mfumo wa kisheria au mfumo wa kisasa wa afya ziligundulika kusababisha wanaume kuwaunga mkono wenza wao katika kipindi cha ujauzito.

Utafiti uliofanyika katika vituo vinne vya afya ulionyesha kwamba huduma za kliniki kwa wajawazito zilikuwa ni duni kwa ujumla. Kati ya mahojiano ya kliniki 36 yaliyofuatiliwa, huduma 12 zinazopendekezwa kwenye mwongozo hazikutolewa kwa mtu yoyote, huduma nyingine 18 zilitolewa kwa asilimia 3 – 58 ya wanawake na huduma 8 zilitolewa kwa wanawake zaidi ya asilimia 80. Utoaji wa huduma wakati wa mahudhurio ya marudio ulikuwa ni mbaya. Badala ya kufuata mwongozo wa ANC, watoa huduma walikuwa wanafuata kadi za kliniki; uchambuzi ulionyesha kuwa huduma za afya ambazo taarifa zake zinahitajika kwenye kadi ya kliniki zilikuwa zinatolewa vizuri zaidi kuliko huduma ambazo hazipo katika

kadi lakini zinatajwa katika mwongozo wa FANC. Pamoja na hayo, kuwepo na ratiba za IPTp zinazotofautiana katika miongozo ya ANC na malaria ilipelekea wafanyakazi wa afya kuendelea kutoa IPTp kwa kutumia ratiba ya mwanzo inayowabana kwenye muda wa kutoa dawa ya SP, licha ya kuwepo kwa ratiba mpya iliyorahisishwa zaidi inayopendekezwa na WHO. Uchambuzi umeonyesha kwamba utekelezaji sahihi wa ratiba hii ya pili unaweza kuongeza kiwango cha utumiaji wa IPTp kwa asilimia 20, kitu ambacho kinaonyesha kuhitajika kufanyika kwa mapitio ya haraka ya mwongozo wa kitaifa wa IPTp. Mbali na sera za afya, desturi ya utoaji wa huduma za afya zilionekana kusababishwa na mazingira magumu ya kazi ya watoa huduma. Ili kukabiliana na vikwazo vya ukosefu wa watumishi wa afya wenye ujuzi, uhaba wa rasilimali na mahitaji makubwa ya huduma za afya, watumishi wa afya walionekana kujiwekea taratibu za kazi nje ya mfumo rasmi, kama vile ratiba za mahudhurio na vipimo na utaratibu wa kutoa huduma kwa watu wengi kwa pamoja kama utoaji wa elimu ya afya na ushauri nasaha kwa makundi.

Ili kuelewa vizuri zaidi jinsi upatikanaji wa vifaa na rasilimali watu zinavyochangia utoaji wa huduma za afya na ubora wake, utafiti huu ulipendekeza na kutumia mtazamo wa "workhood" kama nyenzo mpya ya kufanyia uchambuzi. Kwa kutumia mtazamo wa wanaofanya kazi katika mfumo wa utoaji wa huduma za afya, iliweza kutoa mwanga kuhusu mipaka na uwezo wa watumishi wa afya. Ingawa upatikanaji wa vitu vingi kama dawa, vifaa na miundombinu ulikuwa unasababishwa na mambo yaliyokuwa nje ya uwezo wa watumishi, hata hivyo watumishi wa afya waliweza kuhamasisha rasilimali za kijamii, kiutamaduni na nafasi walizonazo kuziba mapengo yaliyopo na kuleta matokeo ya afya mazuri yanayohitajika kwenye jamii.

Utafiti zaidi unatakiwa kufanyika ili kuthibitisha na kuhalalisha baadhi ya matokeo haya. Kwa kuhitimisha, utafiti huu unasisitiza haja ya kuwa na mkakati kabambe wa kuboresha upatikanaji na utumiaji wa IPTp na huduma nyingine za ANC kwa wanawake wajawazito. Kwa upande wa kisera, ratiba ya IPTp iliyo rahisishwa na kupendekezwa na WHO inapaswa kutekelezwa na kusambazwa kwa watumishi wa afya kupitia ujumbe unaoeleweka kwa ajili ya kunufaika haraka kwa kuongezeka kwa kasi ya utumiaji wa IPTp. Kwa upande wa mfumo wa afya, upatikanaji wa huduma ya IPTp na nyinginezo kwa wajawazito unatakiwa kuboreshwa katika muda mfupi kwa kuhakikisha upatikanaji wa dawa na vifaa kwenye vituo vya afya, matumizi ya kadi za kliniki zilizoboreshwa kama nyenzo za kazi, na kupitia juhudi za kuboresha huduma za mkoba na elimu ya afya. Katika kipindi cha muda mrefu, wahudumu wa afya wenye uzoefu wapatiwe mafunzo ya kujiendeleza ili wazibe pengo la

upungufu wa watumishi wapya wenye ujuzi. Katika ngazi ya jamii njia mbalimbali za mawasiliano zilizopo zitumike kama vile vyombo vya habari na wanajamii wa kujitolea. Aidha, mbinu mpya za mawasiliano kama matumizi ya simu za mkononi katika kuboresha huduma za afya zinaweza kufanyiwa majaribio, ili kuwafikia wanawake na wanaume pia na ujumbe kuhusu faida za kuhudhuria kliniki mapema na kwa wakati, umuhimu wa kujifungua kwenye vituo vya afya na huduma baada ya kujifungua, kwa ajili ya kuongeza ufahamu wao juu ya huduma zinazotolewa katika maeneo hayo na uwezo wao wa kuzipata pale wanapohitaji huduma hizo.

1. Introduction

This thesis aims to contribute to a better understanding of women's access to and use of intermittent preventive treatment during pregnancy (IPTp) and other antenatal care (ANC) services by looking at factors influencing ANC utilization on the demand side and the quality of care on the supply side. The first chapter provides an overview on the burden of malaria during pregnancy, interventions to control it and the role of antenatal care as the main delivery point for interventions to prevent malaria during pregnancy. Subsequently, an overview on the maternal health situation in Tanzania is given and, finally, factors identified in the literature are discussed that influence pregnant women's access to and use of ANC and IPTp in Tanzania.

1.1.   The burden of malaria during pregnancy

Malaria in pregnancy is a common though preventable cause for adverse birth and maternal health outcomes. A recent overview article by Dellicour and colleagues (2010) revealed that each year an estimated 125 million women living in malaria-endemic areas with *P. falciparum* and/or *P. vivax* transmission become pregnant. The authors confirmed earlier estimates of the World Health Organization (WHO) that in Africa 32 million pregnant women are at risk of malaria in areas of stable *P. falciparum* transmission (Dellicour et al., 2010, WHO, 2003b). Infection rates tend to be particularly high and malaria more severe for women in their first and second pregnancies probably because of a combination of immunological and hormonal changes associated with pregnancy and the lack of antibodies important for protection against malaria in the first pregnancy (Rogerson et al., 2007, Steketee et al., 2001). Moreover, adolescent women have been identified as a particular vulnerable group as young maternal age is an additional risk factor for malaria in pregnancy due to lack of a protective semi-immunity (Desai et al., 2007, Granja et al., 2001, Walker-Abbey et al., 2005). As a complicating factor, HIV infection is likely to increase malaria susceptibility and the risk of adverse effects in the 1.25 million pregnant women estimated to be HIV positive in Sub-Saharan Africa in 2009 (ter Kuile et al., 2007, WHO, 2010). The consequences of adverse pregnancy outcomes due to *P. falciparum* infections in stable endemic transmission regions in sub-Saharan Africa, including peripheral or placental malaria, maternal anaemia and low birth weight, are well known (Desai et al., 2007, Steketee et al., 2001, Umbers et al., 2011). Although few infections result in fever symptoms, one in four women living in stable transmission area has evidence of placental infection at the time of delivery and 5-10% of pregnant women may develop severe anaemia (Desai et al., 2007, Guyatt and Snow, 2004).

Up to 20% of low birth weight deliveries can be attributed to malaria in pregnancy (Desai et al., 2007) with proportions of up to 60% found among primiparious women (Uddenfeldt Wort et al., 2008). Malarial infections have been found to peak during the early second trimester and researchers believe that such early infections have a stronger association with low birth weight than infections during later pregnancy (Desai et al., 2007, Umbers et al., 2011). Due to the strong inverse association between low birth weight and child survival, malaria in pregnancy has been estimated to cause 100,000 infant deaths annually in Africa (Guyatt and Snow, 2004).

Providing for the first time global estimates of the annual number of pregnant women at risk including those outside Africa, Dellicour and colleagues called attention to the almost 4-fold higher estimated number of pregnant women at risk in areas with unstable *P.falciparum* and *P.vivax* transmission outside Africa (Dellicour et al., 2010). Despite the fact that infections in areas of low, unstable or seasonal malaria transmission are more likely to result in symptoms and to cause acute maternal illness, low birth weight and maternal or foetal death due to women's low acquired immunity by the time they become pregnant (Lagerberg, 2008), malaria in pregnancy in low and unstable transmission settings has received much less attention (Desai et al., 2007, Steketee et al., 2001).

1.2.   Global action to control malaria in pregnancy

Efforts to control malaria in pregnancy have greatly increased in the last couple of years within the context of concerted global efforts to achieve Millennium Development Goal (MDG) 4, which aims to reduce maternal mortality rates by three quarters and MDG 5, which aims to reduce child mortality by two thirds (UN, 2000), as well as unprecedented international commitment and action to reduce the burden of malaria.

Since 2000, WHO recommends for sub-Saharan Africa a package of interventions to control and prevent malaria in pregnancy. It includes prompt and effective case management of malaria illness, the use of insecticide-treated nets (ITN) and IPTp and is commonly delivered through a combination of malaria and reproductive health programs (WHO, 2004). IPTp consists of an antimalarial treatment given at regular intervals during pregnancy, regardless of the existence of malarial infection and symptoms. Sulphadoxine-pyrimethamine (SP) is the currently recommended drug for IPTp as it has been shown to be a cheap, safe and effective single-dose treatment. In areas with stable *P. falciparum* malaria transmission WHO currently recommends the administration of at least two doses of SP after quickening (first noted movements of the foetus) at least one month apart during ANC visits (WHO, 2004). This

provides a simplification of an earlier delivery schedule that had been restricted to the administration of two doses during two narrow windows at the beginning of the second and third trimester. By no longer limiting IPTp doses to the defined narrow gestational periods, the simplified recommendation assures that even women who attend ANC outside these periods receive IPTp and takes into account the difficulty of assessing gestational age in busy peripheral ANC (Gies et al., 2008). Moreover, it recommends administration of more than two doses in regions where HIV prevalence is higher than 10% (WHO, 2004) acknowledging recent research findings from Kenya, Malawi and Zambia on improved protective health outcomes of three doses for HIV-positive women and their infants (Filler et al., 2006, Gill et al., 2007, Parise et al., 1998, Ter Kuile and Steketee, 2007).

In 2000 in Abuja, Nigeria, African governments pledged to ensure that 60% of pregnant women in malaria-endemic areas have access to effective malaria prevention interventions by 2005 (RBM and WHO, 2003). More ambitious targets have recently been formulated by the Roll Back Malaria (RBM) initiative to reach all pregnant women with IPTp and supply 80% of the general population, including pregnant women, with ITNs by 2010 (RBM, 2008). ANC provides an important distribution channel for ITNs and IPTp since ANC attendance in sub-Saharan Africa has been found to be high (Abou-Zahr and Wardlaw, 2003). Based on national household survey data, van Eijk and colleagues (2011) confirmed in a recent report on the progress of coverage with malaria control interventions among pregnant women from 47 sub-Saharan countries that most pregnant women in these countries visited an ANC clinic at least once during their pregnancy, with a median of 88.4%. However, despite this encouraging finding of high ANC attendance, none of the countries succeeded in achieving the RBM targets. Overall coverage of ITN and IPTp is still inadequate. According to van Eijk et al. 45 of the 47 African countries had implemented an ITN policy and 39 had a policy to promote IPTp for pregnant women by 2007. Despite using a very broad definition of IPTp as "at least one SP dose from any source", overall coverage for IPTp was estimated to be only 18%. This indicates that an estimated 19 million women did not receive any dose of SP as IPTp despite the fact that many of them had attended the ANC clinic. Exceptions were provided by five countries (The Gambia, Malawi, Zambia, Senegal and Zanzibar) reaching coverage levels close to or over 80%. Overall coverage of treated nets among pregnant women was 17% leaving an estimated 23 million women unprotected by an ITN (van Eijk et al., 2011). It is, however, noteworthy that these numbers might not accurately reflect recent increases in coverage levels and use achieved in many countries through numerous mass-

distribution campaigns of free nets (Beer et al., 2010, Gerstl et al., 2010, Terlouw et al., 2010).

The findings of van Eijk et al. (2011) suggest a high number of missed opportunities among women who attended ANC clinics but were not given IPTp or ITNs. Studies that have recently been published identified constraining factors such as unclear IPTp messages especially with regard to timing of the doses, drug stock-outs, limited understanding of the benefits of the IPTp policy, late and infrequent ANC attendance among women and nurses' low performance (Abou-Zahr and Wardlaw, 2003, Anders et al., 2008, Launiala and Honkasalo, 2007, Marchant et al., 2008b, Mubyazi et al., 2008a, Ndyomugyenyi and Katamanywa, 2010).

The increasing resistance of parasites to SP in Africa has raised concerns about its use for IPTp (Menendez et al., 2007). Not long ago IPTp with SP was still be found to be effective among semi-immune pregnant women in areas where SP treatment failure rates were between 20%-40% among symptomatic young children by day 14 (Ter Kuile et al., 2007). However, no data was available on its efficacy in areas with higher resistance rates. In the meantime, parasite resistance rates as high as 95% have been reported from eastern and southern Africa. Recent reports from northern Tanzania suggested that under such conditions IPTp could even have harmful effects since highly resistant parasites seem to function better in the presence of SP (Kelly, 2011, Chico and Chandramohan, 2011). The identification of new safe drugs for IPTp or alternative interventions is therefore urgently needed. Mefloquine and azithromycin-based combinations (ABCs), two leading drug options to replace SP in IPTp, are currently being tested for efficacy and safety during pregnancy (Chico and Chandramohan, 2011). Intermittent screening and treatment of malaria in pregnancy (ISTp) using rapid diagnostic tests to identify and treat positive cases has been found to provide a viable alternative for IPTp in moderately high malaria transmission areas but needs to be further evaluated (Smith et al., 2010, Tagbor et al., 2010). Because new IPTp drugs might require different dosing regimens, improvements in implementation measures at ANC clinics where the responsibility for the delivery of IPTp and malaria case management to pregnant women lies, are crucially important (Crawley et al., 2007, Gutman and Slutsker, 2011).

1.3. Antenatal care

Although first embryonic forms of health programs for mothers and children had already been established at the end of the 19th century in Europe, first principles for antenatal care were only outlined in the 1930s in the UK and Northern Ireland (Bergsjo, 2001, WHO, 2005). In the context of substantially declined maternal mortality due to sepsis, haemorrhage and obstructed labour, the persistently high number of deaths due to eclampsia required an early identification and treatment of women at risk with high blood pressure (Abou-Zahr and Wardlaw, 2003). However, what antenatal care entailed varied widely within and across countries in Europe (Bergsjo, 2001). Adopted and transferred to developing countries, antenatal care in these countries strongly resembled the Western concept in terms of timing and services (Bergsjo, 2001, Villar and Bergsjo, 2002). In many developing countries, ANC has long been regarded as a core component of routine maternal and child health services receiving larger allocations of budgetary resources than delivery care (Abou-Zahr and Wardlaw, 2003, Campbell and Graham, 2006). Only in the 1990s, when a number of randomized trials assessed a new antenatal care model promoting a reduced number of antenatal care visits, did its effectiveness start to be challenged (see f.e. Carroli et al., 2001, Munjanja et al., 1996, Villar and Bergsjo, 2002, Villar et al., 2001). Multi-country trials conducted by WHO lead to the establishment of a new Focused Antenatal Care (FANC) model promoting four antenatal care visits for women with uncomplicated pregnancies, thus emphasizing the quality instead of the quantity of visits. New evidence about effectiveness or ineffectiveness of interventions in reducing maternal mortality revealed that fatal complications occurring during pregnancy, child birth and the postnatal period can not be prevented by antenatal care but require timely access to emergency obstetric care (Bergsjo, 2001, Jaddoe, 2009, McDonagh, 1996). Such an improved understanding of the limited role of antenatal care led to a refocusing of maternal health programs towards ensuring that women have access to care during the critical period around labour and delivery coupled with referral for the management of obstetric emergencies (Abou-Zahr and Wardlaw, 2003, Campbell and Graham, 2006, Kerber et al., 2007).

Yet, there is a broad agreement about the potential of antenatal care for improving maternal and neonatal health (Abou-Zahr and Wardlaw, 2003, Bergsjo, 2001). Stressing the need for continued care during all lifecycles, ANC was recognized to provide an important interface between three levels of the health system: clinical care, primary health care for the family and the community and the clients (Kerber et al., 2007). Due to its relatively high coverage, ANC provides excellent opportunities for the early detection and treatment of pregnancy

anomalies, for the provision of preventive health services and health education on risk factors as well as for the promotion of a health facility delivery with skilled attendance (Campbell and Graham, 2006, Villar and Bergsjo, 2002). Proven effective antenatal interventions include screening for syphilis, provision of preventive malaria-prophylaxis and ITNs, anti-tetanus immunization and prevention of mother-to-child-transmission of HIV and antiretroviral therapy of maternal HIV/AIDS (Bergsjo and Villar, 1997, Villar and Bergsjo, 1997). Provision of advice on potential pregnancy complications, danger signs and information on how to seek medical care during antenatal care are key strategies of ANC to reduce delays in obstetric care (Bergsjo, 2001, Nikiema et al., 2009). Moreover, it provides an opportunity to serve as a contact point to increase demand for services with low coverage such as skilled attendance during childbirth and postnatal care (Campbell and Graham, 2006, Kerber et al., 2007). In fact, strong positive correlations have been reported between the number of ANC visits and the use of skilled birth attendance and postnatal care (Rockers et al., 2009, Wang et al., 2011).
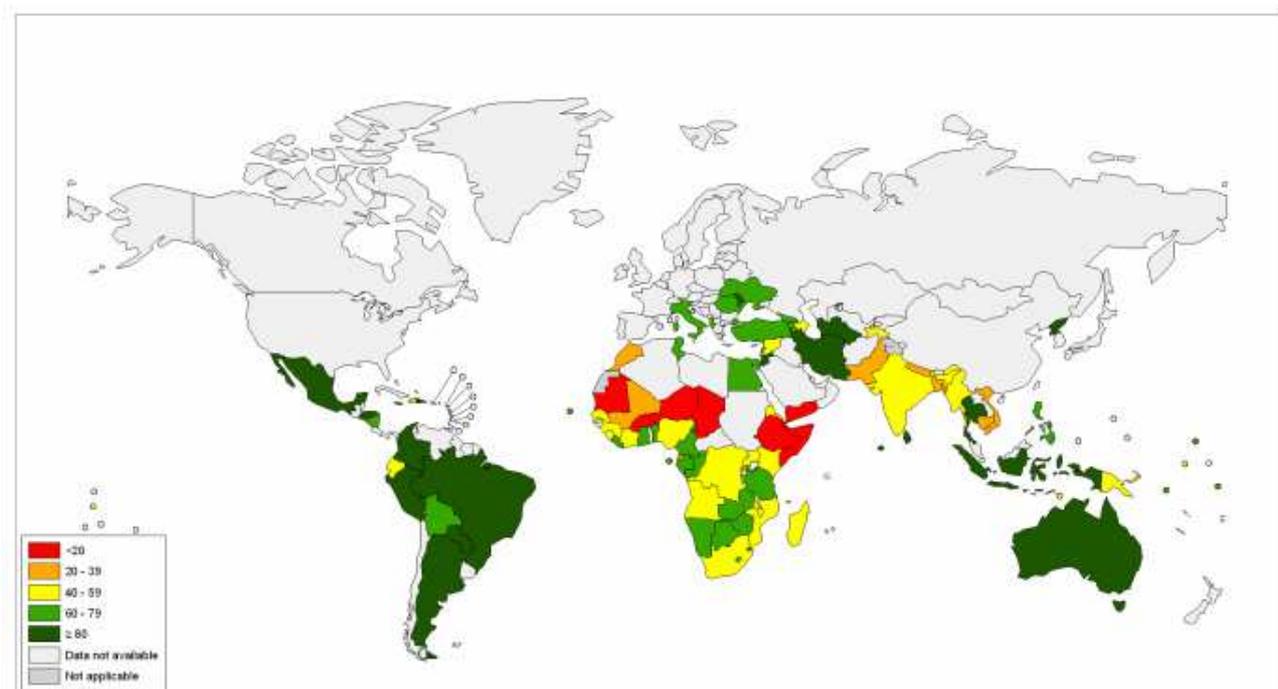
Figure 1: Antenatal care coverage of 4+ visits, 2000 – 2010 (WHO, 2011a)

Coverage levels of antenatal care have notably increased in all developing regions during the 1990s (WHO, 2005). A recent analysis of Demographic Health Survey (DHS) data from 38 developing countries showed fairly high levels of ANC coverage (Wang et al., 2011). Twenty four countries reported coverage levels of over 80% (see also Figure 1). With the exception of some countries with very low ANC coverage levels such as Ethiopia, Chad or Niger,

antenatal care coverage in other sub-Saharan Africa countries varied between 55% and 87% for one visit and between 12% and 78% for four and more visits (Wang et al., 2011). The high coverage of ANC compared to other maternal health services can be partly explained by multiple points for provision and the long time frame for seeking care (Campbell and Graham, 2006). Additionally, costs for ANC are fairly low compared to other health care provisions. Accordingly, there is a high overall level of attendance even among the poorest women and differences in use between the poorest and the least poor have been observed to be lower for ANC than for example for skilled attendance at delivery (Gwatkin, 2004).

Unfortunately, worrying gaps in the provision and the quality of care in terms of prevention, diagnosis or treatment of complications have been reported (Campbell and Graham, 2006, Koblinsky et al., 2006). Evidence has shown that the most common elements of ANC are those of rather ritualistic nature such as measurements of weight and height whereas elements that have proven to be beneficial such as blood and urine tests and information about danger signs have been found to be often inadequately provided (Abou-Zahr and Wardlaw, 2003).

1.4. Malaria during pregnancy and maternal health in Tanzania

There is evidence for decreasing malaria transmission and prevalence in Tanzania due to a range of complementary malaria control measures implemented since the late 1990s (Killeen et al., 2007, O'Meara et al., 2010, Russell et al., 2010, Smithson, 2009). These trends are reflected in an overall decline in severe anaemia, fever incidence, malaria inpatient admission and the proportion of positive fever cases for malaria (Smithson, 2009, Alba et al., 2011, D'Acremont et al., 2010). Despite this fact, malaria is still highly endemic in most regions of the country and continues to be the most significant disease affecting especially young children and pregnant women (NMCP, 2007, WHO, 2009). Furthermore, there is no evidence globally for a reduced risk of malaria during pregnancy without preventive measures in the same areas (Chico and Chandramohan, 2011).

It has been estimated that about 1.7 million pregnant women contract malaria each year in Tanzania (Lynch et al., 2006) leading to a high prevalence of maternal morbidity – such as anaemia and placental malaria infection (Marchant et al., 2002a, Marchant et al., 2004, Menendez et al., 2000) – and mortality (Olsen et al., 2002) as well as adverse birth outcomes such as spontaneous abortion, preterm delivery, congenital infection, still birth and low-birth weight (Hinderaker, 2003, Menendez et al., 2000, Wort et al., 2006a). Prevalence of anaemia

in pregnant women ranges from 23% in low transmission areas (Hinderaker, 2003) to 82% in high transmission areas (Marchant et al., 2002). Placental malaria was found to be strongly associated with a high risk of low birth weight and premature birth even amongst women living in highly endemic areas: nearly one in five children had a low birth weight and 20% of these children were born prematurely (Menendez et al., 2000).

Although Tanzania has made impressive progress in reducing the all-case mortality among children under five – presumably partially the effect of improved malaria control (Masanja et al., 2008) – maternal mortality rates have only slightly decreased after a long period of stagnation at high levels. In 2010, the maternal mortality ratio was estimated to be 454 maternal deaths per 100,000 live births in Tanzania (NBS and ICF Macro, 2011). Haemorrhage, obstructed labour, sepsis and induced abortion – the latter being illegal in Tanzania – have been identified as the main direct causes of maternal death in Tanzania (MacLeod and Rhode, 1998, Mswia et al., 2003, Olsen et al., 2002). Many of these deaths could have been averted with prompt and adequate diagnosis and care. However, 49% of all women in Tanzania still deliver at home without any skilled attendant (NBS and ICF Macro, 2011). Although the numbers of maternal deaths due to HIV/AIDS are difficult to estimate (Mswia et al., 2003), it has been assumed that a considerable number of maternal deaths in Tanzania can be accounted to indirect causes such as HIV/AIDS and also malaria (MacLeod and Rhode, 1998, Mswia et al., 2003, Olsen et al., 2002). HIV prevalence among 15 to 49-year-old women has been found to be 7% but levels vary considerably between regions and between urban and rural settings (NBS, 2008). A study assessing causes of maternal mortality in the Arusha region suggested that malaria contributed to a much higher number of maternal deaths than had previously been assumed (Olsen et al., 2002). According to WHO definition a quarter of all women in Tanzania start childbearing as adolescents – before reaching the age of 20 (WHO, 2006) – with an even higher proportion in rural areas (NBS and ICF Macro, 2011). Adolescent pregnant women have not only been identified as being more at risk from malarial infection (Wort et al., 2006b) and anaemia (Massawe et al., 2002) but also for obstetric complications (Zeck et al., 2010) and are more likely to have children of low birth weight (Wort et al., 2006b). In addition, evidence from Dar es Salaam suggested that unplanned pregnancies and subsequent induced abortions were particularly high among unmarried adolescents still at school (Rasch et al., 2000a, Rasch et al., 2000b).

1.5.   Access to IPTp and ANC services in Tanzania

In 2002, the Tanzanian Ministry of Health and Social Welfare introduced "Focused Antenatal Care" (MoH and JHPIEGO, 2004) following the recommendations of WHO (Villar and Bergsjo, 2002). This new model of ANC propagates a reduced number of four visits during the course of pregnancy for women without complications. Activities during each visit include 1) screening for conditions likely to increase adverse outcomes, 2) providing therapeutic interventions known to be beneficial and 3) educating pregnant women about planning for a safe birth, emergencies during pregnancy and how to deal with them (MoH and JHPIEGO, 2004). Due to the high risk of malarial infection during pregnancy in Tanzania, special focus has been given to malaria prevention and treatment within the new national FANC model. Early recognition and case-management of anaemia and febrile illness thus forms an integral part of antenatal care (MoH and JHPIEGO, 2004, NMCP, 2007). Moreover, social marketing of ITN on a national scale began around 2002 and subsidized ITNs have been provided through the "*Hati Punguzo*" voucher for pregnant women at ANC clinics since 2004 (Hanson et al., 2008). Tanzania adopted the IPTp policy at national level in 2000/01 forming together with Malawi, Kenya, Uganda and Zambia the "IPTp forefront" in sub-Saharan Africa (Crawley et al., 2007, Hill and Kazembe, 2006).

Antenatal care attendance in Tanzania is high but women attend irregularly and start late. According to the Tanzanian Demographic and Health Survey 2010, almost all women (98%) attended the ANC clinic at least once during their last pregnancy. However, only 43% of pregnant women (declining sharply from 63% in 2004/05) reported having made four and more visits as recommended in 2010 (NBS and ICF Macro, 2011, NBS and MEASURE DHS, 2005). With an average of 5.4 gestational months, the majority (85%) of all pregnant women initiated ANC significantly later than the recommended first visit within the first four months of pregnancy (MoH and JHPIEGO, 2004, NBS and ICF Macro, 2011). Hence, women's attendance was far from achieving the target set by the National Malaria Control Program (NMCP) to increase early ANC attendance among pregnant women to 80% by 2012 (NMCP, 2007). Similar late ANC enrolment after more than five months of gestation has been reported by small-scale studies in Tanzania (Marchant et al., 2009, Mpembeni et al., 2007, Mrisho et al., 2009) and elsewhere in sub-Saharan Africa (Kiwuwa and Mufubenga, 2008, Magadi et al., 2000, Ndidi and Oseremen, 2010, Okunlola et al., 2006).

There has been an impressive increase in the use of mosquito nets among pregnant women in Mainland Tanzania from 15% in 2004/05 to 26% in 2008 and 68% in 2010 due to public-

private partnerships providing subsidized mosquito nets to pregnant women and children under 5 years of age and recent mass-distribution campaigns of free nets (NBS and ICF Macro, 2011). A study from the southern zone of Tanzania on preliminary results of a recent "universal coverage campaign" that involved the national distribution of free long-lasting insecticidal nets (LLIN) to every household shows that coverage levels can be assumed to be even higher reaching levels of over 80% (Nathan and Sedekia, 2011). Despite the success of the ITN intervention, IPTp uptake is still poor. While the change of the first line treatment for malaria from SP to Artemether Lumefantrine (ALu) resulted in very low IPTp coverage levels in 2006, they have continued to be poor up to date, particularly for the second IPTp dose. According to the Tanzanian Demographic and Health Survey 2010 60% of all pregnant women in Mainland Tanzania reported having received one dose of SP during an ANC visit but only 27% of them got two or more doses of SP (NBS and ICF Macro, 2011). Similar disappointing second dose coverage levels of below 40% have been reported by other recent studies from Tanzania (Anders et al., 2008, Marchant et al., 2009, Marchant et al., 2008b) and other East-African countries (Gikandi et al., 2008, Kiwuwa and Mufubenga, 2008, Ouma et al., 2007, Sangare et al., 2010). These recent data show that the Abuja targets of supplying 60% of pregnant women with preventive interventions by 2005 (RBM and WHO, 2003) as well as Tanzania's political ambitions to increase the ownership and use of LLINs and the uptake of IPTp to 80% by 2012 is well within reach regarding ITN and LLIN usage (NMCP, 2007). However, coverage levels for IPTp are still far from achieving these targets and are even further away from the more recent target of the RBM initiative of 100% IPTp coverage for pregnant women (RBM, 2008).

Low coverage levels are, however, not restricted to IPTp but also related to other ANC services. National data from 2010 indicated for example that only about half of all women of Mainland Tanzania received information on signs of pregnancy complications (53%), had urine samples taken (51%) or received iron tablets (58%) during their last pregnancy (NBS and ICF Macro, 2011). Sarker and colleagues (2010) reported similar or even lower levels for the supply of information on danger signs (61%), iron tablets (46%), IPTp (68%) and the conducting of urine (9%) and haemoglobin (26%) tests in the Rufiji District. The low uptake of ANC services and also the declining trend in high ANC attendance in Tanzania raises questions about barriers constraining women's access to and use of efficient ANC and IPT services on the demand as well as the supply side. Issues of access to ANC and IPTp have received little attention until recently either in social sciences or in the public health sector (Ribera et al., 2007) and have only been addressed by a growing number of studies in the

last few years. Due to the fact that there is still a considerable scarcity of knowledge about factors influencing access to and use of IPTp and ANC in Tanzania, the following overview on literature also includes studies from East African countries neighbouring Tanzania.

On the **demand side** local perceptions and knowledge of the importance of ANC, local ideas of reproductive vulnerabilities and socio-economic factors determine pregnant women's timing and frequency of ANC attendance and their use of IPTp.

A study by Mrisho and colleagues (2009) from southern Tanzania showed that women decided to attend ANC clinics mainly to assure a healthy pregnancy outcome (i.e. to prevent miscarriage, to get advice from nurses, to have illness diagnosed and treated, to check the development of the baby, to confirm pregnancy) and to conform with health system expectations (i.e. to get the ANC card, to avoid being scolded by nurses). The same study showed that women delayed visiting an ANC clinic because they waited for the foetus to move to be sure that they were pregnant. Others were scared of witchcraft or the ill-will of the community members if pregnancy became public and still others did not feel sick or wanted to avoid the effort of many visits to the clinic (Mrisho et al., 2009). These findings are in line with qualitative studies from southern Tanzania (Haws et al., 2010) and Mozambique (Chapman, 2003) showing that women delayed ANC initiation purposely in order to protect the unborn child from witchcraft attacks of jealous neighbours and kin or malicious gossip. Pregnant woman in Kenya and Malawi considered no need to attend ANC early because they felt well (van Eijk et al., 2006, Launiala and Honkasalo, 2007). Furthermore, women's ANC attendance is clearly mediated by their experiences at earlier ANC visits and the quality of care received (Audo et al., 2005, Ndyomugyenyi et al., 1998).

What remains unclear from the available evidence is whether women know what services ANC clinics should provide and whether they know what they actually get in terms of prevention and treatment while attending ANC and why. Clearly, women's understanding of the importance of these services depends on the information on care received. Studies from rural northern and southern Tanzania showed that despite high ANC attendance women could not mention potential danger signs during pregnancy (Magoma et al., 2010, Pembe et al., 2009, Sarker et al., 2010) and in a rural area of southern Tanzania and Malawi women found it difficult to give specific answers about prevention and treatment they received during ANC and identified and described drugs by shape, number of doses and colour (Mrisho et al., 2009, Launiala and Honkasalo, 2007). Confused understanding of the relevance of drugs and

their dosage makes women entirely dependent on the nursing staff dispensing these drugs (Brabin et al., 2009, Sangare et al., 2010) and they have been found to be highly trusted by the women to adequately administer drugs (Launiala and Honkasalo, 2007). However, studies from Tanzania (Nganda et al., 2004), Malawi (Holtz et al., 2004), Uganda (Sangare et al., 2010) and Kenya (van Eijk et al., 2005) found that pregnant women had extensive knowledge of malaria, a high awareness of its risk during pregnancy and of the benefits of IPTp and these all acted as predictors for the use of ITN and IPTp-SP.

Although quantitative studies have provided mixed evidence, inadequate ANC attendance and IPTp uptake has repeatedly been associated with low education and low socio-economic status (van Eijk et al., 2006, van Eijk et al., 2005, Gikandi et al., 2008, Holtz et al., 2004, Kiwuwa and Mufubenga, 2008, Ouma et al., 2007, Ochako et al., 2011). In western Kenya, women with up to or more than 8 years of education were not only four times more likely to have visited an ANC but also two times more likely to have visited the ANC more than once and to have started the ANC in the first or second trimester than women who did not complete 8 years of education (van Eijk et al., 2005, van Eijk et al., 2006). Other studies from Kenya found that women of low/medium socio-economic status were likely to attend ANC late or irregularly or not at all (van Eijk et al., 2006, Magadi et al., 2000). Moreover, low ANC attendance and IPTp uptake have been strongly associated not only with high parity (Ndyomugyenyi and Katamanywa, 2010, Magadi et al., 2000, Gikandi et al., 2008, Holtz et al., 2004, van Eijk et al., 2004), but also with premarital status and unwanted pregnancies, particularly among adolescents (Magadi et al., 2007, Magadi et al., 2000, Gikandi et al., 2008). Adolescent pregnancy might deter young pregnant women from attending ANC as it is often perceived as socially unacceptable and is stigmatized (Magadi et al., 2000). Studies from Uganda showed that pregnant adolescents were more likely to experience violence from parents, to be rejected by their partners, expelled from schools and to be stigmatized (Atuyambe et al., 2008, Mbonye et al., 2006) and therefore more likely to try to hide their pregnancy (Mbonye et al., 2006). Although several studies provided evidence on the important role of the family in enhancing or constraining ANC attendance through advice or decision-making (van Eijk et al., 2006, Atuyambe et al., 2008, Simkhada et al., 2010), social and cultural determinants of prenatal care usage among adolescent and adult pregnant women are still not well understood (Ryan et al., 2009).

On the **supply side**, access to ANC and IPTp is determined by the accessibility and affordability of health care, the availability of infrastructure, human resources and supplies

such as drugs and diagnostic tools as well as whether the way services are offered to the women match the pregnant women's expectations.

Although distance from the homestead to the health facility was mentioned in several studies, it did not turn out to be a predictive factor of ANC attendance in Kenya (Holtz et al., 2004, van Eijk et al., 2006) and Uganda (Ndyomugyenyi et al., 1998). Compared to other sub-Saharan countries, Tanzania has an extensive health infrastructure with nearly 5,000 dispensaries throughout the country with about 72% of the population residing within 5km and 90% residing within 10km of a health facility (Mpembeni et al., 2007, NBS and Inc., 2007). ANC and assistance of uncomplicated deliveries are offered at all reproductive and child health clinics present at any health institution level (Urassa, 2004). Although reproductive and child health (RCH) services should be delivered free of charge in Tanzania, lack of money was found to be a main reason for women to delay ANC attendance in southern Tanzania (Mrisho et al., 2009). Similarly, other study from Tanzania revealed that although direct costs were low for ANC, there were considerable indirect and opportunity costs due to long waiting hours and travelling times, particularly for those women living in rural areas, and that these factors substantially influenced their decisions on whether, when and where to attend ANC (Kowalewski et al., 2002, Mubyazi et al., 2010).

The problem of shortages of drugs and other supplies is common and well known in Tanzania. Many health facilities are inadequately equipped to provide ANC and IPTp services. This can partly be attributed to factors at the level of individual facilities or a district due to incorrect or late drug and supply orders or irrational drug use but shortages also occur very much due to major and longstanding problems along the national drug chain (Health Research for Action, 2006, Euro Health Group, 2007). A national survey showed that the proportion of facilities having stocks of SP available for IPTp improved from 59% in 2007 to 71% in 2008, but provided evidence on the low availability of other key items required at ANC such as iron tablets and Mebendazole which in 2008 were out of stock in every second and fourth health facility, respectively (Marchant et al., 2009). An early study on the impact of operational factors on maternal mortality in Dar es Salaam highlighted that in addition to poor management, lack of drugs and shortages of trained staff were the main causes for increased maternal deaths occurring at health facilities (Urassa et al., 1997). Several other scholars pointed towards the human resources challenges in the Tanzanian health sector. Despite a high population growth, the health work force has been declining over the past years (Maestad, 2006). Understaffing of qualified health staff has been reported to be worst

in rural public sector dispensaries (Mamdani and Bangser, 2004, Olsen et al., 2005). According to Kurowski et al. (2007) the human resources likely to be available in 2015 are far below of the numbers required, thus constraining Tanzania's capacity to extend priority interventions addressing communicable diseases, maternal and perinatal conditions and nutritional deficiencies. Although the impact of lacking infrastructure, drugs and trained staff on health workers' performance, workplace trust and motivation has been acknowledged (Manongi et al., 2006, Manzi et al., 2004), few studies have investigated how these factors influence daily work experience, capacities and attitudes from a health workers' perspective.

Instead the focus has rather been on technical quality of care referring to the appropriateness of a diagnosis or prescribed treatment and inter-personal care including proper advice (Campbell et al., 2000). Recent studies examining single antenatal care programs or routine ANC provision in Tanzania reported in particular the poor quality of technical aspects such as clinical and laboratory examinations (Boller et al., 2003, Gilson et al., 1993, Sarker et al., 2010, Urassa et al., 2002) or drug administration (Boller et al., 2003). Boller et al. (2003), who assessed quality of care in public and private ANC clinics in Dar es Salaam, found that guidelines were frequently not respected and diagnostic examinations were not carried out by health workers. At 12 minutes for first visits and 6.5 minutes for return visits, consultation times were short and differed significantly from the required time anticipated in the FANC guidelines (42 minutes and 32 minutes respectively) (von Both et al., 2006). Thus health problems may often have been missed (MacLeod and Rhode, 1998). On top of this, there have been reports of poor counselling and inadequate health education of pregnant women (Magoma et al., 2010, Pembe et al., 2009, Sarker et al., 2010, Urassa et al., 2002, von Both et al., 2006) and health workers' negative or even abusive attitudes towards patients (Mrisho et al., 2009, Tibandebage and Mackintosh, 2005).

2. Conceptual framework

The preceding overview on literature clearly illustrated that despite the existence of national policies to control malaria in pregnancy and to mitigate other pregnancy related risks, coverage levels for frequent ANC attendance and for interventions known to be beneficial, such as IPTp, are low and the quality of care at ANC clinics is inadequate. This thesis investigates the relationship between guidelines – reflecting evidence-based knowledge and "best practices" – and actual practices by exploring the influence of social and structural determinants on pregnant women's use of IPTp and ANC on the demand side and on health workers' service delivery on the supply side. By doing so, the thesis aims at contributing to a better understanding of women's access to and use of IPTp and ANC in the rural setting of the Kilombero Valley, Tanzania.

The following section presents the conceptual background of this thesis. It illustrates our understanding of access to health care, practice and social determinants of health and is based on recent discussions and developments around these concepts.

2.1. Access to health care

Access to quality health care has become a much debated topic since the 1990s and plays a significant role in international health debates. Although, access to health care was already a topic in US sociological studies in the 1970s and 1980s, the debate on access to medicine experienced a special boost with the rapid spread of the HIV/AIDS epidemic.

The brief overview of access to ANC and IPTp services in Tanzania presented at the end of the last chapter illustrates that access is determined on the one hand by the availability, accessibility and affordability of adequate preventive and curative treatment and essential medication at health facilities (the supply side) and on the other hand by the interplay of various factors and actors at the household and community level regulating the knowledge, perceptions and resources of those who look for preventive and curative treatment (the demand side).

A useful and widely known model defines access "as a concept representing the degree of 'fit' between the clients and the system" (Penchansky and Thomas, 1981). This model suggests examining the interface between health services and clients along five dimensions: 1) the availability as the relationship between the clients' needs and the volume, type and adequacy of existing health services and goods; 2) the affordability as the relationship between the price of services and the clients' income and ability to pay; 3) the accessibility as

the relationship between the location of supply and the location of clients, taking into account clients' means of transportation, travel time, distance and costs; 4) the accommodation as the relationship between the manner in which the supply of care is organized and the clients' needs, perceptions and ability to accommodate it and 5) the acceptability as the relationship between the personal and practical characteristics of providers and the clients' attitudes (Penchansky and Thomas, 1981). The model takes into account concerns of both services and clients and, if necessary and possible, suggests adjusting health services to better "fit" the needs, demands and characteristics of the clients. It places, however, less emphasis on what it means for people to "gain access" (Gulliford et al., 2002) and on factors constraining or facilitating the process of utilizing health services.

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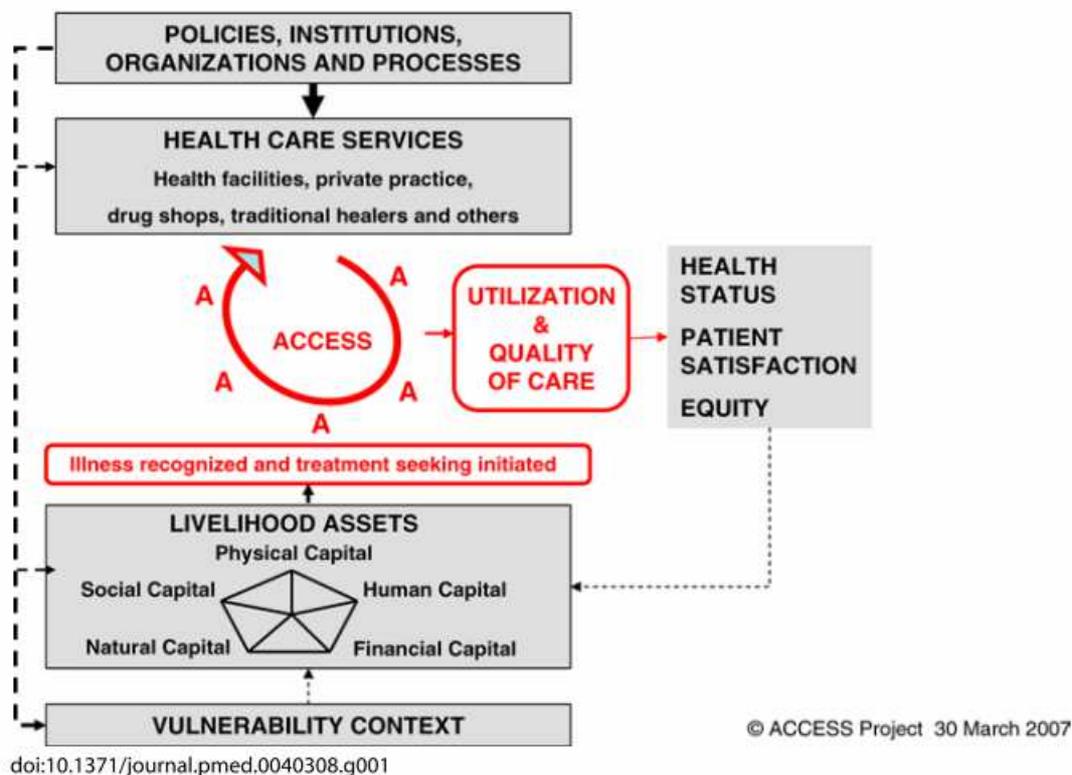
Figure 2: The Health Access Livelihood Framework (Obrist et al., 2007)

In presenting an innovative "Health Access Livelihood Framework" (Figure 2), Obrist and colleagues (2007) argued in a recent publication that bringing together the strengths of different approaches and perspectives, such as social sciences, public health and development studies, is most useful in achieving a comprehensive analysis of access to health care. By placing access to health care services in the broader context of livelihood insecurity the "Health Access Livelihood Framework" allows the analyzing of community and health system barriers equally. Health-seeking study approaches that focus on the clients are well suited to studying how social relationships and cultural conditions influence decision-

making for treatment, treatment-seeking and patient-provider interaction and how these
processes are determined by broader political, economical and geographical conditions.
They provide a better understanding of why, when and how individuals as social actors seek
access to health care services. Health service studies on the other hand aim at identifying
barriers at the community, health system and policy levels with the aim of enhancing access
to services by reducing supply side barriers and increasing the communities' health literacy.
Studies applying the Livelihood Framework developed by the British Department for
International Development (DfID) to health stress the importance of not only possessing
resources but the ability to mobilize them in case of illnesses (Obrist et al., 2007).

Emphasizing the linkages between the micro and the macro level, the framework not only
places people and their actions at the centre of access, but also makes reference to the
influence of policies, institutions, organizations and processes (PIOP) with the latter including
broader trends in society, global health policy, research and development. By doing so, the
framework not only stresses the impact of different social, institutional and political
arrangements such as cultural norms, institutional regulations, health policies and juridical
laws on people's access to and use of health services but also on their access to livelihood
assets needed to gain access to health services (Obrist et al., 2007).

2.2. Practice

Interest in understanding the dialectic relationship between "agency" and "structure"
(Giddens, 1979) resulted in the development of a practice-oriented approach in the social
sciences during the late 1970s (Bourdieu, 1977, Ortner, 1984). Applied to health, such an
approach draws attention to the ways patients or clients as individual social actors deal with
opportunities and constraints (i.e. user fees, attendance schedules, availability of drugs) they
are faced with while interacting with other individuals or groups (i.e. family members or health
workers) and the specific cultural, historical, economic and political contexts they are living in
(Obrist, 2006). Practices are relational and occur in interaction with others. Hence, practice
theory places emphasis on the importance of power relationships and domination (Ortner,
1984) as they are inherent for example in patient-provider-relationships. The focus is,
however, not only on the influence of the "structure" on practice but also takes into account
the reverse impact of practice on the "structure". As Ortner puts it "what a practice theory
seeks to explain is, then, the genesis, reproduction and change of form and meaning of a
given social/cultural whole" (Ortner, 1984:149). In the following the focus will be on the

dialectic relationship between institutions as social determinants of health and social actors' practices on the supply and side demand.

2.3. Institutions as social determinants

Huge inequalities in health existing around the world between and also within countries and the efforts to decrease them through joint health initiatives have in the last decade brought the attention of the international health community to "social determinants of health" (Marmot, 2005). Although scholars such as Rudolf Virchow and Friedrich Engels already outlined the importance of political, economic and social forces on health in the 19th century, the general acknowledgement of the impact of societal and social determinants on the health of individuals and groups is heavily based on recent research on health inequality and its causes, as well as the establishment of the WHO Commission on Social Determinants of Health (CSDH) in 2005 (Raphael, 2006, Starfield, 2006). WHO has defined social determinants of health very broadly as "the conditions in which people are born, grow, live, work and age, including the health system" (WHO, 2011b). It is obvious that unfavourable societal circumstances of daily life such as poverty, unemployment, exposure to diseases, lack of water and sanitation or lack of food cause ill health. What is less commonly recognized is that these circumstances are in turn shaped by wider structural drivers of social nature such as social stratification in society, biases, norms and values within society, global and national economic, social policy and processes of governance at the global, national and local levels that influence the distribution of money, power and resources and thus are responsible for health inequities (Raphael, 2006, CSDH, 2008). Hence, these social determinants of health can be understood as the "causes of the causes" (CSDH, 2008).

The concept of institutions as developed and used by scholars of the "New Institutionalism" has been applied in this thesis as a suitable approach to gain deeper insights into the functioning of the social "causes of the causes". By referring to the term institution we draw particularly on conceptualizations of the economist Douglass North (1990). Together with other scholars he provided an influential framework to explore the classical economical question of who gets what, when and how. To answer this question it is essential to understand how both collective (norms and rules) and policy/governance institutions affect people's access to assets (Bingen, 2000). According to North, institutions that operate at all levels and in all spheres "are a guide to human interaction, so that when we wish to greet friends on the street, drive an automobile, buy oranges, borrow money, form a business, bury our dead, or whatever, we know (or can learn easily) how to perform these tasks" (North, 1990:3f). North understands institutions as dynamic and changeable rules, norms and values

regulating interactions in daily life that are comparable with the "rules of the game" of a competitive team sport consisting of formal written rules as well as typically unwritten codes of conduct that underlie and supplement formal rules (North, 1990). Accordingly, he distinguishes between *formal institutions* that refer to laws, policies and regulations imposed by the state and *informal institutions* such as norms, rules and values that develop within local communities[1] (North, 1990).

In the context of maternal health, health workers' health care practices are strongly shaped by *formal institutions* embedded within the health system such as health policies, regulations and evidence-based clinical guidelines. Yet, literature has shown that social factors such as peer pressure, perceived patient's preferences and team support as well as the health workers' own cultural background, attitudes and experiences not only influence their attitudes towards the patients but also impact on the health workers' clinical decision-making and everyday health care practices. Hence, some authors suggested that health professionals often rather follow "mindlines"[2] than guidelines (Chandler et al., 2008, Gabbay and le May, 2004). These "mindlines" are the "result of day to day practices based on socially constituted knowledge" rather than evidence-based knowledge (Gabbay and le May, 2004:3). A better understanding of health workers' "mindlines", informal practices and routines and their interface with formal guidelines and health policies is critical for improving quality of care.

At the community level, *informal institutions* in form of values and norms reflect institutionalized 'old' practices (e.g. food taboos during pregnancy) and 'new' practices (e.g. visiting the ANC). They provide structures but also meaning to women's "repertoires" of reproductive activities, including health seeking (Bingen, 2000). Some institutions are contested (e.g. men should be involved in maternal health issues and ANC) and have to be adapted to changing circumstances. Others function along the lines of gender, ethnicity, poverty or lineage that regulate social structures of control over resources and access (e.g. men have decision-making power over financial resources necessary for accessing reproductive health care). A better understanding of the continuum of institutions, be it values (e.g. women should rest more during pregnancy), norms (e.g. unmarried adolescent women

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[1] It is clear, that in reality boundaries between formal and informal institutions are less clear-cut (de Sardan 2008). Rules at community level might be very formal while state regulations might become of an informal nature due to lack of state control and a functioning sanction system. Understanding the difference between formal and informal institution as a conceptual one, the author adheres in this thesis to the distinction suggested by North (1990).

[2] Although the term "mindlines" implies their cognitive nature, it is noteworthy that they are usually not consciously reflected or intentionally applied by health workers but rather subconsciously enacted in daily practices.

should not become pregnant) or regulations (e.g. IPTp needs to be provided twice during pregnancy or women should use antenatal services early) is highly relevant for improving women's use of and access to antenatal care and other maternal care services in areas like rural Tanzania. The better social ideas, values and norms structuring reproductive vulnerabilities and practices are understood, the better we can explain why, when and how clients seek access to maternal health services.

In the context of institutions, practices are often highly patterned and routinized and sometimes proceed with little reflection of the actors either because "that was the way of our ancestors" or because they have been institutionalized over time. It would be wrong, however, to assume institutions to be static. They are shaped by history, politics and social negotiations and therefore are closely related to processes and social change (Bingen, 2000). Social actors (i.e. individuals or groups) are the potential driving force for institutional change since they produce and reproduce ideas, values, norms and regulations – or oppose to them as another sporting analogy from North nicely illustrates: "Some teams are successful as a consequence of (and have therefore the reputation for) constantly violating rules and thereby intimidating the opposing team. Whether that strategy pays off obviously depends on the effectiveness of monitoring and severity of punishment" (North, 1990:4). Whereas North's example illustrates the effect of strategic violation of rules, Tripp (1997) using an example from the informal economic sector in the 1980s in Dar es Salaam showed that poor people might react with non-compliance to existing formal rules imposed by the state because they have no other option of gaining a living, thereby initiating institutional change. Tripp illustrated how the process of developing alternative structures and institutions that gradually became internalized and socialized by an increasing number of people eventually came to replace many of the problematic state rules (Tripp, 1997).

Understanding the role of social actors – and most importantly of "institutional agents" (Scott, 2008) who shape the way people think and act – is therefore highly relevant. In the context of maternal health, grandmothers, men, traditional birth attendants (TBA) but also health workers might play a potential role in facilitating or constraining access to antenatal and other maternal care services. While grandmothers and TBAs certainly have a great influence on women's reproductive health practices at the community level, health professionals are of particular interest since they may create and transfer new values and norms to the clients and patients at the health system level (Scott, 2008). Moreover, they play a crucial role and greatly influence whether pregnant women feel comfortable attending the ANC services, get

all the services they should get and clearly understand what the purpose of the services is. Despite this fact, there has been "a surprising lack of attention to the human (worker) elements" (Franco et al., 2002a) with regard to effective health care delivery .

Health policy analysis and also epidemiological and biomedical frameworks are of limited assistance in understanding the internal dynamics of health systems such as patient-provider relationships and health worker practices that influence quality of care (Gilson, 2003). The focus of public health research has so far rather been on the identification of constraining determinants and the risk factors of health. Social science studies conducted in the field of international health, on the other hand, have for a long time limited the focus on the investigation of people's cultural perceptions and representations of health and illness and their influence on people's treatment seeking (Nichter, 2008). The use of the institutional approach allows us to investigate social determinants of health by looking at how local norms and values and also processes of governance at the community and health system levels influence individuals' practices and interactions on the demand as well as the supply side. Illustrating the linkages and interfaces between the state, the health system and the community it demonstrates the potential of institutional arrangements not only to constrain pregnant women's access to health care but also to facilitate it. Thus, contrary to the common focus on risk factors of public health research such an institutional approach allows looking at resources and assets, such as IPTp and ANC that have the potential to strengthen women's access to and use of health services.

3. Aims and objectives

The overall aim of this thesis is to contribute to a better understanding of women's access to and use of IPTp and other ANC services in the rural setting of the Kilombero Valley, Tanzania.
As indicated in the literature overview, coverage levels for IPTp and other ANC services in Tanzania and elsewhere are often low and health workers' performance regarding the delivery of these services is poor. To better understand reasons behind the discrepancies, between "best practices" recommended in guidelines and actual practices, this thesis explores factors influencing pregnant women's use of IPTp and ANC services on the demand side and health workers' service delivery practices on the supply side, with special focus on institutions as social determinants. Insights gained will be used to formulate recommendations for research and practice.

For this reason, the following general and specific objectives have been defined:

1. To investigate the coverage level of IPTp in the study area (Chapter 4)

2. On the demand side (Chapter 4, 5 and 6):
   2.1. To assess adult and adolescent pregnant women's utilization of ANC services with particular regard to the timing of their first ANC visit
   2.2. To identify and explore factors influencing adult and adolescent pregnant women's utilization of ANC services

3. On the supply side (Chapter 4, 7 and 8):
   3.1. To explore the quality of ANC care
   3.2. To identify and investigate factors influencing health workers' IPTp and ANC practices and the quality of care

4. Study setting and methods

The present study was conducted in close collaboration with the ACCESS Programme implemented from 2004 until 2011 under the direction of the Ifakara Health Institute (IHI) with technical support from the Swiss Tropical and Public Health Institute (Swiss TPH) and funds from the Novartis Foundation for Sustainable Development (NFSD). The aim of the programme was to better understand and improve access to prompt and effective malaria treatment through a set of integrated interventions targeting both users and providers.

The following section presents a description of the study area as well as the methodological approach used for this research.

4.1. Study area

The research for this thesis was conducted within the Demographic Surveillance System (DSS) area of the two districts Kilombero and Ulanga, Morogoro Region, in south-eastern Tanzania (Figure 3). The two districts are divided by the low-lying floodplain of the Kilombero River that is defined by the Udzungwa Mountains to the north and by the Mahenge Mountains to the south. Large parts of the valley are regularly flooded by the Kilombero River during the rainy season from November to May. In 2002, a total population of approximately 517,000 lived in the 109 villages of the two districts (National Bureau of Statistics, 2006). Ifakara, situated at 320km from Dar es Salaam, is the major business town in the Kilombero valley with a population of approximately 55'000 (Menendez et al., 2007b). Mahenge, Ulanga's district capital, is smaller with about 7,300 people (Hetzel, 2007).

The DSS site which was set up in 1996 includes a total of 25 villages (Armstrong Schellenberg et al., 2002, Armstrong Schellenberg et al., 1999). The total population was estimated at 92,000 in 2008 (Alba et al., 2010). Within the DSS area DSS interviewers living in the villages collect data on pregnancies, births, deaths, migrations and socio-economic indicators for every household three times a year (Armstrong Schellenberg et al., 2002). Based on this data, the fertility rate was estimated at 5.3 births per woman and the maternal mortality ratio at 500 deaths per 100,000 live births in 2008 (Spangler and Bloom, 2010).
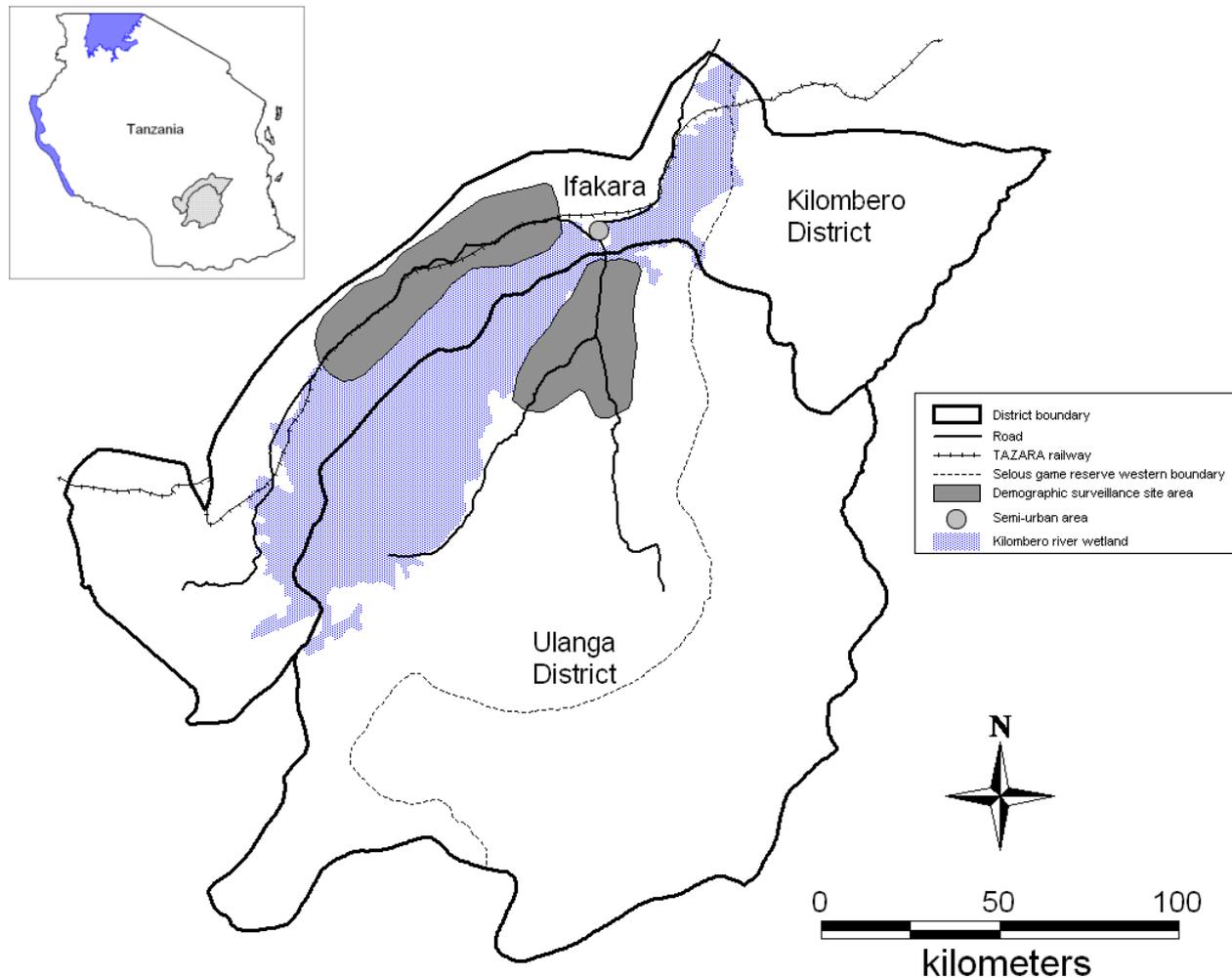
Figure 3: The Kilombero and Ulanga DSS site

Most people living in the area rely on farming. Men obtain additional earnings through fishing and casual labour, while women run small-scale businesses trading local brewery or farm products (Armstrong Schellenberg et al., 2002, Hausmann Muela, 2000). The major cash crops produced in the fertile wet plain of the Kilombero Valley are rice and to a lesser extent maize, banana and cassava. Since good fertile plots become increasingly scarce, people are forced to cultivate farming sites (*shamba* in Swahili) that are a considerable walking distance from their homes. Thus many families have a second house known as *shamba* house in a low-lying farmland area where they stay for several weeks or months in temporary shelters during the rice planting and harvesting seasons (Hetzel et al., 2008). Besides timber, charcoal and some fish, rice is the main agricultural export product sold to private buyers for trading at the local markets and exporting to other regions of Tanzania (Hausmann Muela, 2000, Hetzel, 2007). Commercial and trading activities have increased in the area due to the construction of the Tanzania Zambia Railway (TAZARA) by the Chinese between 1970 and

1975 that connects parts of the Kilombero district with Mbeya and Dar es Salaam and also due to improved conditions of the mainly unpaved roads (Minja, 2001). However, despite these opportunities the majority of people still live in extreme poverty.

There is a remarkable mix of ethnic groups in the area due to historical and contemporary migration patterns, colonial settlement policies and the Socialist's villagization (*ujamaa*) that brought inhabitants of remote locations to organized villages in the Kilombero Valley in the early 1970s (Minja, 2001). The Ndamba and Pogoro are the most numerous groups and considered as 'indigenous', while other groups like the Bena, Hehe, Chagga and Sukuma have migrated more recently into the area (Minja, 2001). Increasing numbers of Sukuma and Maasai pastoralists moved to the valley with large cattle herds in the 1980s leading to tensions between the pastoralists and the villagers (Haddelsey et al., 1997). In 2006, the government ordered them to reduce their herds in order to preserve the Kilombero wetland ecosystem (Hetzel, 2007) with the consequence that many of them then settled down to combine agriculture and cattle breeding to gain a living.

The valley's warm climatic and ecological conditions are favourable for mosquito breeding (Russell et al., 2010). Malaria is highly endemic in the area with a peak of transmission during the rainy season (Drakeley et al., 2003, Russell et al., 2010). In the early 1990s, malaria transmission in this area was amongst the highest in Tanzania with a mean entomological inoculation rate (EIR) of over 300 infective bites per person per year (Smith et al., 1993). In the meantime, malaria transmission in the area has been reduced substantially through the extensive use of untreated and (long-lasting) insecticide-treated nets and effective malaria drugs (Killeen et al., 2007, Russell et al., 2010). Despite evidence of a substantial reduction in cases of fever and severe malaria in children and adults (Alba et al., 2011), malaria is still the most commonly diagnosed cause of illness in health facilities (Alba et al., 2010b, Hetzel et al., 2007). However, recent studies suggested that malaria has been heavily over-diagnosed (personal communication V. D'Acremont), in particular in the semi-urban setting of Ifakara where malaria transmission is much lower than in the surrounding rural area (Drakeley et al., 2003).

A study conducted in the area by Marchant and colleagues (2002, , 2004) identified severe anaemia due to high-density malaria parasitaemia and other factors as a major health problem for pregnant women but also for their children, since children of women suffering from severe anaemia during pregnancy were found to be more likely to die within the first

year of life. A later hospital-based study investigating the occurrence of malaria among pregnant women who did not report receiving IPTp during their pregnancy showed that due to high ITN coverage in the area the prevalence of placental parasitaemia among primigravid and secundigravid women in Ifakara remained relatively low at 8%. The risk of delivering a low birth weight infant was highest in women not using a mosquito net (Kabanywanyi et al., 2008).

At the time of study a total of 13 first and second-level health facilities offered regular outpatient services within the DSS area. Among them, 12 (ten government and two faith based) facilities provided ANC services for pregnant women on a weekly or daily basis from Monday to Friday. The two district hospitals in Ifakara and Mahenge provided labour and referral care for pregnant women not only from the two towns and the surrounding villages but also from more distant areas. In the course of the Tanzanian Health Sector Reform the districts introduced a cost-sharing scheme in public facilities, including an exemption policy for pregnant women and children under five years of age.
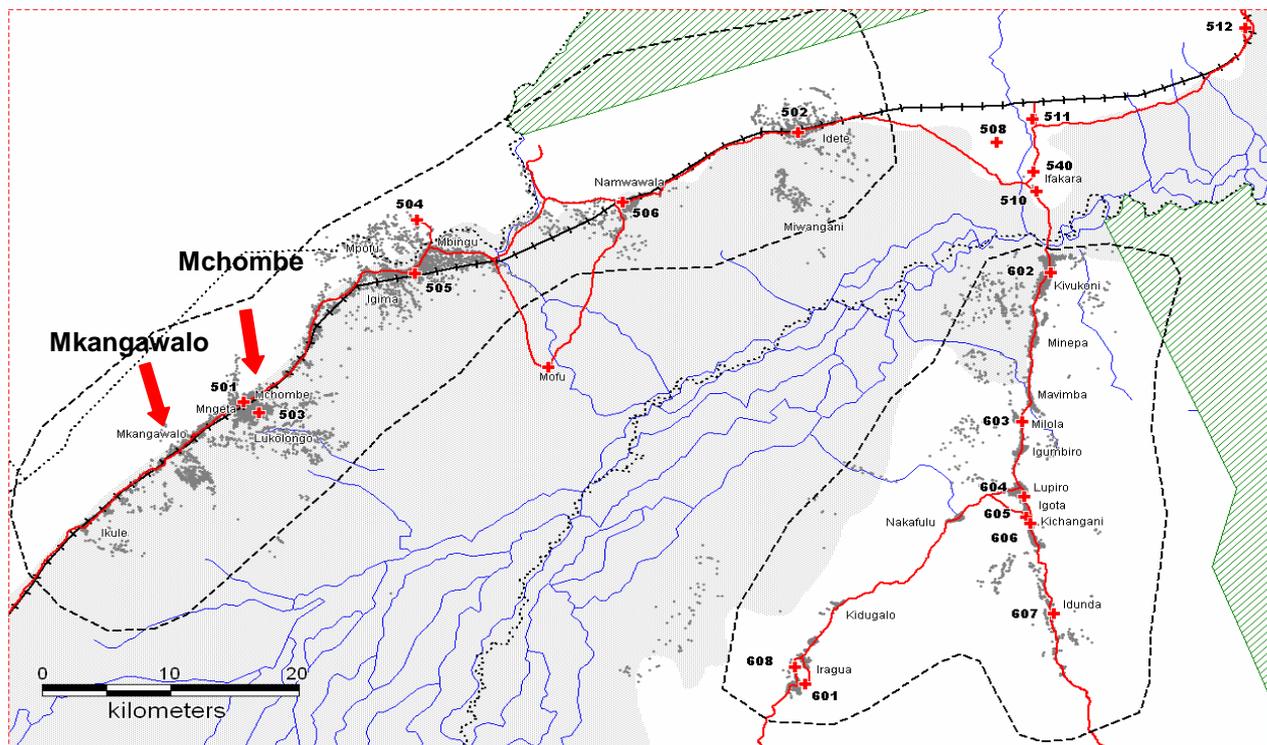
Figure 4: Location of Mchombe and Mkangawalo within the DSS area (Hetzel et al., 2008)

Most qualitative research studies conducted within the frame of this thesis were carried out in the two villages of Mchombe and Mkangawalo in the Kilombero district (Figure 4). In 2008, Mkangawalo had a population of 6,215 while Mchombe was smaller with 4,758 inhabitants.

The two villages differed regarding accessibility, business activities and ethnic homogeneity/heterogeneity: Mkangawalo, having no TAZARA train station, was only accessible by a mud road that was often hardly passable, especially during the rainy season from December to April. Most habitants belonged to the Ndamba ethnic group and lived from farming. In contrast, Mchombe had a railway station and formed a lively commercial centre. It was marked by ethnic heterogeneity and diverse livelihood activities. The two villages were also different in terms of the accessibility of health services, including antenatal care. While inhabitants of Mkangawalo had to travel between 10 and 17km to the nearest health facilities, Mchombe had two health facilities within a short distance: a Mission facility and a health centre in the neighbouring village[3].

4.2. Methods

This thesis applied an approach of triangulation of data and perspectives. Data triangulation refers to the combination of data from different sources that have been collected at different points of time, at different locations and from different people (Flick, 2005). A set of different quantitative and qualitative research methods was used in order to benefit from the specific strengths inherent in each method. Qualitative research methods are most suitable to explore new topics and to investigate people's perceptions and representations from their point of view and to contrast them with people's actual practices and to generate hypothesis and theories. Qualitative interviews such as focus group discussions (FGD) or individual in-depth interviews allowed us to explore what people *say* – their experiences, perceptions, beliefs and attitudes – and to uncover social norms and values, and their ambiguity (Bloor et al., 2001), whereas observational studies help to capture what people *do*. Quantitative research methods, on the other hand, are effective at answering questions related to the distribution of specific factors and its associations with the outcome. However, they are less suitable to provide information on the social, historical and political context within which people decide and act and to explain the reasons behind people's practices.

A triangulation of perspectives was applied by investigating women's access to IPTp and ANC services both from the demand side as well as from the supply side. Triangulation of data and perspectives thus allows us to explore the presented aims and objectives from different angles thereby contributing to a deeper understanding of how individual, health system, and policy aspects influence pregnant women's access to IPTp and ANC services.

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[3] The selection of these two distinct villages was not based on an intention to conduct a systemic comparison between these two villages but rather to gain an understanding of the influence of different settings.

Fieldwork for this thesis was conducted during a one-year field stay that was split into several visits of one to seven months between April 2007 and June 2009. Research was carried out in three sequential phases as illustrated in Figure 5:
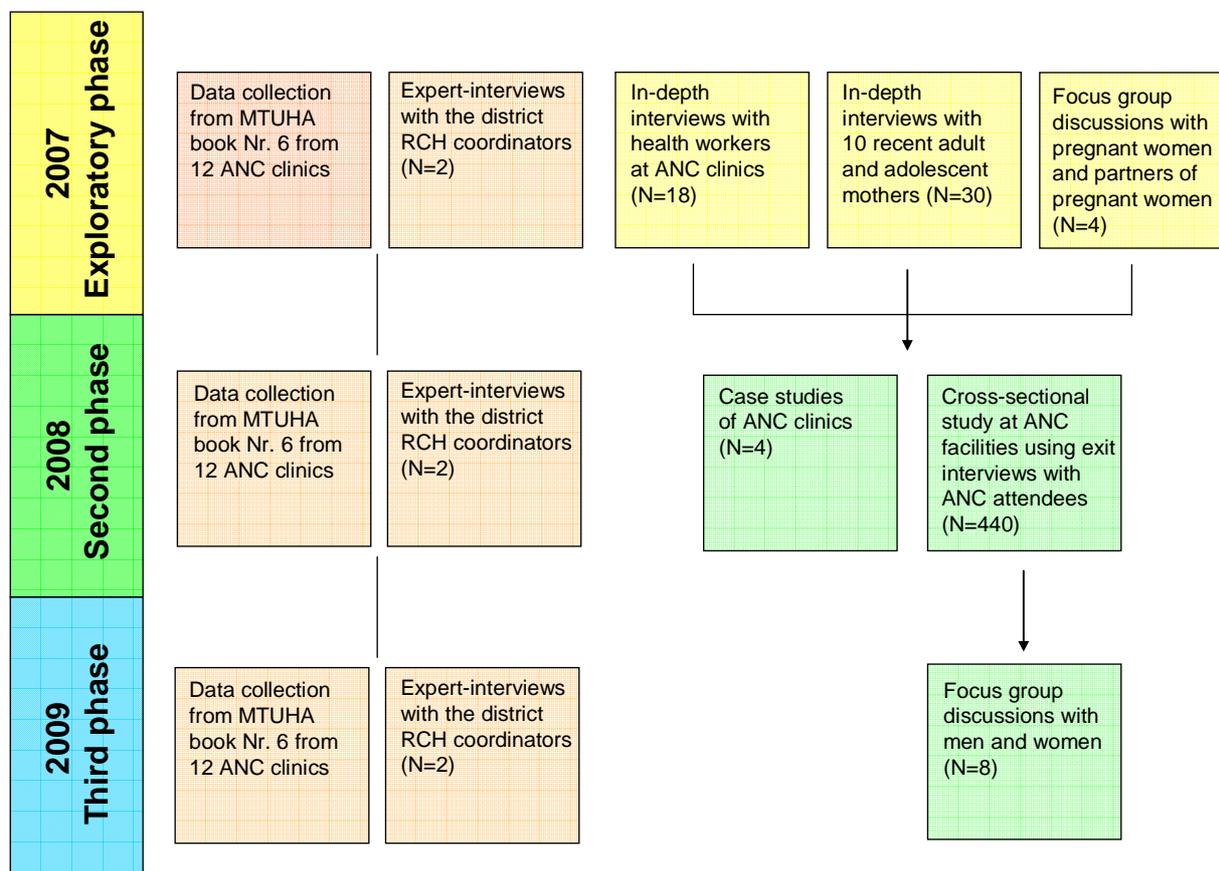
Figure 5: Study design

The **first phase** was an exploratory phase that helped to inquire into issues related to pregnancy that were of concern to the communities, the health workers and the district authorities. In-depth interviews with health workers who regularly provided ANC services; FGDs with pregnant women and husbands/partners of pregnant women; in-depth interviews with adolescent and adult recent mothers and key informant interviews with the RCH coordinators of the two districts were carried out.

▪ In-depth interviews with 18 health workers were conducted in May 2007 at the 12 health facilities providing ANC services on a regular basis within the DSS in order to explore reasons for the low IPTp uptake observed in 2007. All health workers routinely working at the ANC clinic and available on the day of visit were included. Between one

to three health workers were interviewed per health facility. They had between 6 months and 24 years of work experience at the respective health facilities and had obtained a variety of professional qualifications. The interviews explored 1) the health workers' knowledge about and attitudes towards the IPTp strategy and 2) their perceptions on factors influencing IPTp provision. A semi-structured interview guide was used that had been designed in English and piloted outside the study area. The use of an interview guide ensured that the main topics were covered, since interviewees were encouraged to express their opinions and concerns freely. All interviews were carried out by a locally trained sociologist together with the author. The interviews were tape-recorded after obtaining informed written consent from the health workers. Results of this study are reported in Chapter 5.

- Four <u>focus group discussions</u> involving a total of 15 pregnant women and 21 men married or currently living with a pregnant woman were conducted in June 2007 in the two villages of Mchombe and Mkangawalo. The focus group discussions concentrated on broad aspects of maternal health issues and malaria during pregnancy. They were conducted in Swahili and carried out in separate gender groups with the help of a male and a female team consisting of fieldworkers and a trained sociologist from the ACCESS Programme. The FGDs were designed and undertaken following the manual of Dawson et al. (1993).

- A total of 30 <u>in-depth interviews</u> were conducted between July and August 2007 with a group of ten women selected for the purpose who had delivered a child within the previous three months in Mchombe and Mkangawalo. Six adolescent mothers aged between 16 and 19 years old and four adult mothers between 20 and 33 years of age were identified with the help of DSS fieldworkers who were informed about recent births in the villages. As teenage pregnancy represents a sensitive topic each woman was visited four times for two to three hours to establish a more personal relationship. During informal conversations information was gathered at each visit on the woman's social and economic background, her pregnancy and child birth history and on her treatment seeking behaviour and her access to maternal health services during pregnancy. Often other family members or neighbours took part in the conversations. The use of an un-structured field guide assured that all questions were covered over the course of four visits. Minimal notes were taken during the conversions that were afterwards discussed, elaborated and completed together with a local research

assistant who was a trained sociologist. Questions that arose during this process were addressed at the next visit.

Based on the insights derived from the exploratory studies of the first phase of fieldwork two main research questions were formulated: 1) when do pregnant women in the study area start ANC attendance and what factors influence their timing and 2) how do health workers provide IPTp and ANC services and what factors determine the quality of care.

The **second phase** included extensive qualitative and quantitative data collection through a cross-sectional study using exit interviews with ANC attendees and case studies of four health facilities in order to answer the presented research questions.

- The <u>cross-sectional survey</u> was carried out between June and October 2008 involving a total of 440 exit interviews with pregnant women attending ANC at health facilities. Out of the 12 health facilities regularly providing ANC services, ten facilities (nine government facilities and one faith-based facility) were selected and visited once a month. Since accessibility of health services in this rural context is constrained by seasonal conditions such as weather, agricultural work in the rice fields and the availability of money, exit interviews were spread over several months. The two other health facilities were not included because very few women visited the ANC clinic. Two previously trained local female fieldworkers conducted the interviews in Swahili which included questions on women's demographic characteristics, their knowledge of malaria prevention and ANC services, factors influencing their early or late ANC attendance, as well as their actual ANC service utilization and IPTp usage. Additionally, information on ANC service utilization and IPTp use was copied from women's ANC cards. Chapter 5 and 6 report on the findings of this study.

- <u>Case studies in four ANC clinics</u> were conducted during research visits of one week per facility in July 2008 and short one-day follow-up visits in April 2009. The four public health facilities were selected within the Kilombero/Ulanga DSS area: one health centre and one selected dispensary from each district. The selection of the dispensary was based on the criteria of daily RCH service provision and the high number of pregnant women attending it for ANC services and was based on the Health Management Information System (HMIS) data previously collected. Data collection was based on different qualitative methods including: 1) participant observation of

daily RCH clinic procedures, 2) structured observation of ANC consultations, 3) informal conversations with pregnant women and health workers, and 4) in-depth interviews with the health workers working at the RCH clinics at the time of the study. Data from observation and informal conversations were collected in descriptive field notes. A checklist of all recommended ANC services was developed on the basis of the Tanzanian FANC guidelines in order to record observed service delivery during ANC consultations. Towards the end of the week in-depth interviews with the health workers were conducted focusing on contextual factors influencing health workers' ANC practices, perceived work problems, work expectations and relationships with patients, colleagues and supervisors. All interviews were tape-recorded with the health workers' permission. All data collection was carried out in Swahili by the author together with a local research assistant. The findings of this study are reported in Chapter 8 and 9.

Findings from the exit interviews with ANC attendees suggested that husbands or partners had an important influence on women's early ANC attendance. Focus group discussions with men and women were conducted during the **third phase** of research in order to explore men's social and economic support of pregnant women and the factors influencing this support.

- A total of eight <u>focus group discussions</u> were conducted in April 2009 in Mchombe and Mkangawalo. In each village group discussions were conducted in separate age (under/over 35-year-olds) and gender groups. The FGDs were carried out with the help of a male and a female research team including a trained sociologist and three local research assistants trained in qualitative data collection. Each group consisted of 8 to 14 married and unmarried participants, involving a total of 85 men and women. Participants were invited to describe men's responsibilities towards pregnant women, factors underlying men's neglect of these responsibilities, differences between men's support of married or unmarried pregnant women, including adolescents, differences in men's support compared to the past and the men's involvement at ANC clinics. Results of this study are reported in Chapter 7.

Several research activities, such as the collection of data from the HMIS and in-depth interviews with the RCH coordinators of the Kilombero and Ulanga districts, were conducted **during all three phases**.

- ▪ <u>HMIS records</u> were collected on a yearly basis between 2007 and 2009 from health facility registers at all 12 health facilities offering ANC care services. Of special interest were data on the number of pregnant women attending the ANC clinic at least once; the proportion of adolescent pregnant women (defined as younger than 20 years of age); pregnant women's timing of the first ANC attendance (registered as before/after 20 gestational weeks) and the number of delivered IPTp doses and subsidized ITN vouchers (*"Hati Punguzo"*). In 2008 and 2009, performance measures in form of the number of pregnant women that the health workers had attended at ANC clinics and the number of IPTp doses and ITN vouchers provided were reported back to the health staff together with other research results.

- ▪ <u>Key informant interviews with the two RCH coordinators</u> of the Kilombero and Ulanga district were conducted each year in order to stay informed about maternal health interventions and the coordinators' concerns related to the maternal health situation within the district. Moreover, the opportunity was used to clarify questions that had arisen during research and to get inputs on planned studies. In 2008 and 2009, the meetings with the RCH coordinators in Mahenge and Ifakara were used to report research results back to them.

Participation, observation and informal conversations with men and women the author became acquainted with while staying in Ifakara and the surrounding villages allowed to garner important background information on people's daily living conditions and how these conditions impacted on people's health. This was especially the case in Mchombe where the author lived several weeks with a local family, was involved in daily household activities and used the bike as a means of transport to visit the interviewees living in Mchombe and Mkangawalo.

4.3. Data entry and analysis

Tape-recorded interviews conducted in Swahili were transcribed and all interviews, except the FGDs with men and women conducted in 2009, were translated into English by research assistants fluent in English and Swahili. Analysis of qualitative data was guided by qualitative content analysis (Mayring, 2007) using the qualitative data analysis software MAXqda2 (VERBI Software, Marburg, Germany). Quantitative data from the exit interviews were double-entered using Microsoft Access, validated with EpiInfo version 3.3.2 (EpiInfo

Association, Denmark) and analysed in Stata10 (StataCorp, College Station, Texas, USA). Further details on data analysis are provided within the method sections of the specific chapters.

4.4. Ethics

All studies were carried out in the frame of the ACCESS Programme which was cleared by the National Institution for Medical Research of Tanzania (NIMR/HQ/R.8c/Vol. I/66) (ACCESS Programme, 2008b). Ethical approval was further provided by the Institutional Research Committees of the Swiss Tropical and Public Health Institute (SwissTPH) and the Ifakara Health Institute (IHI). The District Medical Officer (DMO) was informed about all research activities and authorized them.

For studies carried out at the community level permission was obtained from the respective village authorities. All studies conducted at health facilities were previously discussed with the RCH coordinators of the Kilombero and Ulanga districts and the health facility staff granted permission to conduct the study at their facilities. All study participants provided informed oral or written consent after having been told the purpose of the study and were informed of their rights to withdraw from the study at any time.

5. The combined effect of determinants on coverage of intermittent preventive treatment of malaria during pregnancy in the Kilombero Valley, Tanzania

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5.1. Abstract

5.1.1. Background

Intermittent preventive treatment during pregnancy (IPTp) at routine antenatal care (ANC) clinics is an important and efficacious intervention to reduce adverse health outcomes of malaria infections during pregnancy. However, coverage for the recommended two IPTp doses is still far below the 80% target in Tanzania. This paper investigates the combined impact of pregnant women's timing of ANC attendance, health workers' IPTp delivery and different delivery schedules of national IPTp guidelines on IPTp coverage.

5.1.2. Methods

Data on pregnant women's ANC attendance and health workers' IPTp delivery were collected from ANC card records during structured exit interviews with ANC attendees and through semi-structured interviews with health workers in south-eastern Tanzania. Women's timing of ANC visits and health worker's timing of IPTp delivery were analyzed in relation to the different national IPTp schedules and the outcome on IPTp coverage was modelled.

5.1.3. Results

Among all women eligible for IPTp, 79% received a first dose of IPTp and 27% were given a second dose. Although women initiated ANC attendance late, their timing was in line with the national guidelines recommending IPTp delivery between 20-24 weeks and 28-32 weeks of gestation. Only 15% of the women delayed to the extent of being too late to be eligible for a first dose of IPTp. Less than 1% of women started ANC attendance after 32 weeks of gestation. During the second IPTp delivery period health workers delivered IPTp to significantly less women than during the first one (55% vs. 73%) contributing to low second dose coverage. Simplified IPTp guidelines for frontline health workers as recommended by WHO could lead to a 20 percentage point increase in IPTp coverage.

5.1.4. Conclusions

This study suggests that facility and policy factors are greater barriers to IPTp coverage than women's timing of ANC attendance. To maximize the benefit of the IPTp intervention, revision of existing guidelines is needed. Training on *simplified* IPTp messages should be consolidated as part of the extended antenatal care training to change health workers' delivery practices and increase IPTp coverage. Pregnant women's knowledge about IPTp and the risks of malaria during pregnancy should be enhanced as well as their ability and power to demand IPTp and other ANC services.

5.2. Background

Malaria is still a major cause of morbidity and mortality in Tanzania, especially for small children and pregnant women (NBS and MEASURE DHS, 2005). About 1.7 million pregnant women contract malaria each year in Tanzania (Lynch et al., 2006) leading to a high risk of suffering from severe anaemia, spontaneous abortion, preterm delivery, congenital infection, still birth and low-birth weight (Desai et al., 2007, Steketee et al., 2001). Malaria during pregnancy is a contributing factor to both maternal death (Olsen et al., 2002) and infant morbidity and mortality (Hinderaker, 2003, Menendez et al., 2000). Infection rates have been found to be especially high in women in their first and second pregnancy (Garner and Gulmezoglu, 2006, Steketee et al., 2001), but also depend on other factors such as endemicity, immunity, age, trimester and co-morbidities (Lagerberg, 2008).

Committing themselves to the Abuja targets, Tanzania and other countries in sub-Saharan Africa adopted the World Health Organization's (WHO) recommendation for malaria prevention and control during pregnancy (RBM and WHO, 2003). In areas of stable malaria transmission in sub-Saharan Africa, this means the implementation of an intervention package into the antenatal care (ANC) services including the use of insecticide-treated nets (ITN) and intermittent preventive treatment in pregnancy (IPTp) as well as effective case management of malaria and anaemia (WHO, 2004). Thus, every Tanzanian pregnant woman attending an ANC clinic is entitled to receive a national voucher for a subsidized ITN, known as *Hati Punguzo* ("discount card" in Swahili) and IPTp (Hanson et al., 2008). In 2003, WHO defined IPTp as the delivery of two doses of an anti-malarial to pregnant women at the beginning of the second and third trimester irrespective of the presence of signs for a malaria infection (WHO, 2003). Sulphadoxine-pyrimethamine (SP) is the drug currently used for IPTp in areas of Africa where malaria is transmitted by *Plasmodium falciparum* as it has been shown to be a cheap, safe and effective single-dose treatment (Parise et al., 1998, Shulman et al., 1999, WHO, 2004). There is also evidence that the intervention is well accepted by women in various African settings (Mubyazi et al., 2010, Smith et al., 2010). Taking health workers' difficulties to assess gestational age into account, WHO modified and simplified the IPTp recommendations in 2004: "beginning of the second trimester" was replaced by "after quickening" (first noted movements of the foetus) and "third trimester" by "at least one month apart". This change in wording also implies that more than two doses can be administered (Gies et al., 2008, WHO, 2004). In the context of the HIV epidemic and increasing SP resistance, discussions have arisen on the optimal number of IPTp doses required to

maintain protection for the mother and her child. Based on its relatively low HIV prevalence rate of 6% (NBS, 2008), Tanzania is the only East-African country to keep a two dose regimen regardless of HIV status (MIPESA, 2006) as WHO recommends the introduction of a three dose regimen where HIV prevalence is above 10% (WHO, 2004).
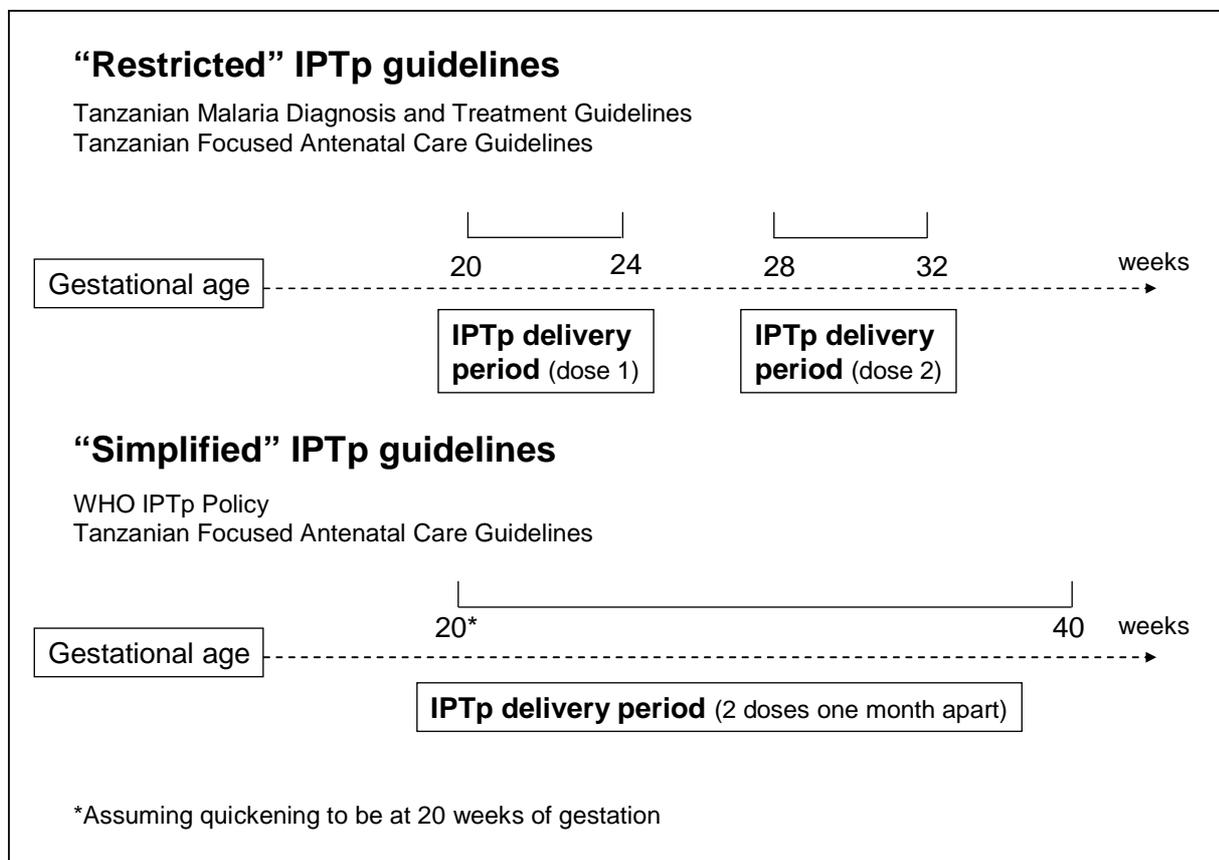
Figure 6: The two national guidelines

In Tanzania, two different IPTp recommendations are available and they partially disagree with current WHO recommendations (see Figure 6). Firstly, the revised national malaria diagnosis and treatment guidelines from 2005 recommend the administration of a first dose of IPTp between 20-24 weeks and a second dose between 28-32 weeks of gestation (MoHSW, 2006). This recommendation is critically different from the current WHO recommendation that all pregnant women in areas of stable malaria transmission should receive at least two doses of IPTp after quickening and at least one month apart (WHO, 2004). Secondly, based on WHO's new ANC model and drawing on the experiences from Kenya, Tanzania developed in 2002 the Focused Antenatal Care (FANC) guidelines with specific reference to malaria in pregnancy (MoH and JHPIEGO, 2004). The FANC guidelines in principle follow the revised WHO IPTp recommendation by stating that IPTp "can be given

at any point in pregnancy after 16 weeks as long as [the doses are] one month apart" (MoH and JHPIEGO, 2004:81) and "is safe from quickening up to 40 weeks of gestation" (MoH and JHPIEGO, 2004:86). Confusingly, the guidelines also still recommend IPTp to be delivered between 20-24 weeks and again between 28-32 weeks of gestation (MoH and JHPIEGO, 2004:104).

Tanzania was among the first countries to adopt IPTp as a national strategy in 2000 along with Malawi, Kenya, Uganda and Zambia (Crawley et al., 2007). ANC attendance is high with 62% of women attending at least four times (NBS and MEASURE DHS, 2005). Yet coverage is still far from reaching the target of 80% IPTp coverage by 2010 as proposed by the RBM Partnership and set in Tanzania for 2012 (NMCP, 2007, RBM and WHO, 2003). Coverage levels of the second IPTp dose are particularly low. According to the Tanzanian Malaria and HIV Indicator Survey 2007/08 57% of all pregnant women reported receiving one dose of IPTp but only 30% said they were given a second dose during an ANC visit (NBS, 2008). Disappointing second dose coverage results of below 40% have also been found by other studies from Tanzania and East Africa (Anders et al., 2008, Gikandi et al., 2008, Holtz et al., 2004, Kiwuwa and Mufubenga, 2008, Marchant et al., 2008b).

Recent studies have stressed the need to investigate the impact of available guidelines on implementation, health worker practices and drug stock-outs at the health facilities in order to understand the reasons for low IPTp coverage (Anders et al., 2008, Gikandi et al., 2008, Holtz et al., 2004, Kiwuwa and Mufubenga, 2008, Marchant et al., 2008b, Ouma et al., 2007). However, only a few studies have addressed these factors so far. Instead, studies have associated low IPTp uptake with women's late initiation and irregular attendance of ANC services (Akinleye et al., 2009, Kiwuwa and Mufubenga, 2008, Launiala and Honkasalo, 2007). Others have investigated the relationship between IPTp uptake and women's knowledge about malaria (Akinleye et al., 2009, Holtz et al., 2004, Launiala and Honkasalo, 2007, Mubyazi et al., 2005, Nganda et al., 2004). Yet others have explored the influence of pregnant women's age, marital status, educational level, socio-economic status or parity on IPTp uptake (Anders et al., 2008, Nganda et al., 2004, van Eijk et al., 2005). Overall, studies with a focus on women's individual characteristics were not able to explain low IPTp levels (Gikandi et al., 2008, Holtz et al., 2004, Kiwuwa and Mufubenga, 2008, Nganda et al., 2004, van Eijk et al., 2005). Two recent studies from Tanzania demonstrated that delivery of IPTp was influenced by facility and policy level factors. Marchant et al. (2008b) analysed national household and facility survey data from Tanzania and identified insufficient SP stocks at the

health facilities and restrictive guidelines as the main reasons for low IPTp delivery. Similarly, Anders et al. (2008) argued that revised guidelines and improved drug stocks would allow for delivery of IPTp at an earlier gestational age and to increase IPTp coverage.

The aim of this paper is to assess the combined impact of women's timing of ANC attendance, health workers' IPTp delivery and different delivery schedules of national IPTp guidelines on IPTp coverage. The study used ANC card records collected during exit interviews with ANC attendees to analyze pregnant women's timing of ANC visits and health workers' delivery and timing of IPTp in relation to the main IPTp guidelines in use in Tanzania and to model the anticipated outcome of a second set of guidelines on IPTp coverage.

5.3. Methods

5.3.1. Study area

This study on IPTp coverage was conducted in the frame of a wider research project that explored determinants of access to ANC and IPTp services in the Kilombero and Ulanga Districts of the Morogoro Region in south-eastern Tanzania between April 2007 and May 2009. The two districts are divided by the floodplain of the Kilombero River which is delimited by the Udzungwa Mountains to the north and by the Mahenge Mountains to the south. Large parts of the valley are regularly flooded during the rainy season from November to May. The study area coincides with a Demographic Surveillance System (DSS) that encompasses a total of 25 villages of the two districts with an estimated total population of 92'000 in 2008 (Alba et al., 2010, Armstrong Schellenberg et al., 2002). In the early 1990s, malaria transmission in this area was amongst highest in Tanzania with a mean entomological inoculation rate (EIR) of over 300 infective bites per person per year (Smith et al., 1993). Although malaria transmission in the area has been reduced substantially through the use of untreated and insecticide-treated nets and effective malaria drugs, it remains high and perennial (Killeen et al., 2007, Russell et al., 2010). Malaria is still the most commonly diagnosed cause of illness in health facilities (Hetzel et al., 2007), but there is recent evidence that malaria is over-diagnosed, especially in the urban and peri-urban areas (personal communication V. D'Acremont). The area is predominantly rural and households rely heavily on agriculture of rice, maize, banana and cassava. During the rice planting and harvesting seasons many people move for several months to temporary shelters in distant farming sites (Schellenberg et al., 1999).

The Tanzanian public health system consists of a wide network of dispensaries, health centres and hospitals with each facility serving between 3,300 and 7,000 people (Armstrong Schellenberg et al., 2004). At the time of study a total of 13 first and second-level health facilities offered regular out-patient services within the DSS area. Out of these, 12 (ten government and two faith based) facilities provided ANC services for pregnant women on a weekly or daily basis from Monday to Friday. Two district hospitals provide referral care for complicated cases. In the course of the Tanzanian Health Sector Reform the districts have introduced a cost-sharing scheme in public facilities, including an exemption policy for pregnant women and children under five years of age.

DSS records suggest that in 2008, 3,033 women became pregnant in the Kilombero and Ulanga DSS. Women reported an average of 3.1 visits to ANC clinics over the course of a pregnancy (personal communication: M. Alexander). Data collected from the Health Management Information System (HMIS) on the DSS area indicated that IPTp coverage had increased from 24% to 45% between 2006 and 2008 for one IPTp dose and from 7% to 21% for two doses (Gross, unpublished data).

5.3.2. Study design and study population

The study draws on data from two study components of the larger research project: 1) in-depth interviews with health workers at the ANC clinics were conducted in June 2007 and 2) exit interviews with ANC attendees were performed over a five month period between June and October 2008.

In-depth interviews with 18 health workers at 12 ANC clinics were conducted, including all health workers routinely working at the ANC clinic and available on the day of visit. Between one to three health workers were interviewed per health facility.

A total of 440 pregnant women visiting an ANC clinic participated in the exit interviews. Ten facilities (nine government facilities and one faith based facility, five in the Kilombero district and five in the Ulanga district) were selected and visited once per month for one day. Since accessibility of health services in this rural context is constrained through seasonal conditions such as weather, agricultural work or availability of money, the exit interviews were scattered over several months. Two other health facilities in the study area (one government facility and one faith based facility) were not included in the study because very few pregnant women attended ANC services there. On average, 12 randomly selected pregnant women were interviewed per visit (min-max=1-21) adding up to a total of 43 pregnant women interviewed per health facility (min-max=28-79).

5.3.3. Data collection instruments

Health worker in-depth interviews. The interviews explored a) health workers' knowledge and attitudes towards the IPTp strategy, and b) their perception on factors influencing IPTp delivery. A semi-structured interview guide was designed in English and piloted outside the study area. The interview guide ensured the coverage of the main topics, but interviewees were encouraged to express their opinions and concerns freely. The interviews were translated and administered in Swahili. All but one of the interviews were tape-recorded after obtaining written informed consent from the health workers.

Exit interviews with ANC attendees. Participants were interviewed by two trained local female field workers after obtaining the women's informed consent. The main investigator supervised data collection during the two first rounds and checked the completeness of the data collected.

Information was collected using a structured questionnaire. The questionnaire was designed in English, translated to Swahili, back-translated and pre-tested outside the study area. Since the exit interviews were conducted in the frame of a larger research project to investigate pregnant women's access to ANC and IPTp services, questions were related to a) demographic characteristics, b) knowledge about ANC services and motivation to attend the ANC clinics, and c) ANC service utilization, but also inquired d) women's knowledge on malaria prevention, and e) their IPTp use. Additionally, data on the number and timing of ANC visits and IPTp doses received were copied from the ANC cards in order to avoid recall bias.

5.3.4. Data analysis

The in-depth interviews with the health workers were transcribed and translated into English. Analysis was done using the qualitative data management software MaxQDA2 (Lucanus GmbH, Berlin, Germany). Text segments were coded into categories using qualitative content analysis (Mayring, 2007). Key themes emerging around health workers' knowledge on and experiences with the IPTp strategy were cross-tabulated in order to explore differences between and within health facilities.

From the exit interviews mainly ANC card data were analysed for the purpose of this study. Demographic data on marital status, socio-demographic status and level of education will not be investigated in this paper as several previous studies from Tanzania and elsewhere have not demonstrated any association between these characteristics and IPTp uptake (Gikandi et al., 2008, Marchant et al., 2008b, NBS, 2008, Nganda et al., 2004).

Data were double-entered using Microsoft Access, validated with EpiInfo version 3.3.2 (EpiInfo Association, Denmark) and analysed in Stata 10 (StataCorp, College Station, Texas, USA). Descriptive results are presented using medians and interquartile ranges (IQR=75th-25th percentile). Differences in proportions were calculated using chi-square test and Fisher's exact test where appropriate. For all statistical tests a two-sided P-value less than 0.05 was considered significant.

Firstly, women's timing of ANC visits and their eligibility for IPTp according to national guidelines were assessed. Women were assumed to be eligible for IPTp doses if they attended the ANC clinic between 20-24 weeks and/or 28-32 weeks of gestation. Secondly, health workers' IPTp delivery and its timing were evaluated in relation to the national guidelines by using ANC card records on women's gestational age at the time of IPTp receipt. In order to avoid biases resulting from the inclusion of women who according to guidelines were not yet eligible for IPTp due to their low gestational age, IPTp uptake was analysed for two sub-samples: 1) women of at least 20 weeks of gestation and 2) women of at least 28 weeks of gestation. Thirdly, it was estimated how the two different schedules of the national IPTp policies available in the malaria diagnosis and treatment guidelines and the FANC guidelines fit with women's timing of ANC attendance and health workers' IPTp delivery and timing. For simplicity, the two IPTp guidelines will be denoted as *restrictive* IPTp guidelines (recommending IPTp administration between 20-24 and 28-32 weeks of gestation) and *simplified* IPTp guidelines (recommending two doses of IPTp after quickening and at least one month apart) (Figure 6). For the *simplified* IPTp guideline, correct IPTp delivery was defined as two doses administered at any time between 20 weeks of gestation, which is the time when most women have already recognized first movements of the foetus (O'Dowd and O'Dowd, 1985), and 40 weeks of gestation as long as they are one month apart. Finally, the combined impact of women's timing of ANC attendance and health worker's delivery and timing of IPTp on the effectiveness of the IPTp strategy was assessed for each of the two national IPTp guidelines. Only women who had made at least two ANC visits were included (N=189) in the sample. Effectiveness loss was calculated in steps by calculating: 1) the number of women who attended ANC services twice timely according to the guidelines in order to be eligible for IPTp doses; and 2) the number of women who attended timely and received one or two doses of IPTp.

5.3.5. Ethical considerations

The study was carried out in the frame of the ACCESS Programme which has been cleared by the National Institution for Medical Research of Tanzania (NIMR/HQ/R.8c/Vol. I/66) (ACCESS Programme, 2008a). The study was also approved by the review boards of the Swiss Tropical and Public Health Institute (STPH), formerly known as Swiss Tropical Institute (STI), and the Ifakara Health Institute (IHI), formerly known as Ifakara Health Research and Development Centre (IHRDC). The study was discussed and approved by the district coordinators for Reproductive-and-Child-Health (RCH) and staff in-charge was asked for permission to conduct the study at their facilities. Oral or written consent was obtained from all pregnant women and health-workers participating in the study after explaining the purpose of the study to them and informing them of their right to withdraw at any time. Health workers were asked for the permission to tape-record the interviews.

5.4. Results

5.4.1. Study population

A total of 18 health workers participated in in-depth interviews. They had between 0.5 and 24 years of working experience at the specific health facility and obtained different professional qualifications: 44% (8/18) were medical attendants (attended a one-year training), 22% (4/18) were MCH (Mother and Child Health) Aides (attended a two-year training), 22% (4/18) were certificated Nurse Midwifes (attended a four-year nursing training or upgrade training) and 6% (1/18) were Nursing Officers (attended a six-year training in nursing).

Of the 440 pregnant women who participated in the exit interviews, 10 women were excluded from the analysis because their ANC cards did not contain information on gestational age. Table 1 summarizes the characteristics of the 430 participants. The median age of the respondents was 25 years (IQR=31-21) and 15% (62/430) of all women were 19 years old or younger. Among all women, 52% (225/430) had completed 7 years of primary school, 88% (377/430) were married and 20% (84/430) were in their first pregnancy. Overall, the median number of pregnancies was 3 (IQR=5-2, including the current pregnancy). On the day of the interview, the majority of women were either between 20-24 weeks (43%, 185/430) or between 28-32 weeks of gestation (30%, 128/430). Median gestational age at the time of the interview was 24 weeks (IQR=28-20). Among all participants, 56% (241/430) attended the ANC clinic for the first time in their current pregnancy on the day of the interview. The median number of ANC visits was one (IQR=2-1).

Table 1: Socio-demographic characteristics of the respondents

Characteristic	%	(n) N=430
Age groups		
<20	15	(62)
20-24	33	(132)
25-29	20	(83)
30-34	18	(72)
35-39	11	(44)
>39	3	(12)
Education level*		
No education	24	(103)
Incomplete primary	23	(99)
Primary +	52	(225)
Marital status		
Married or living with partner	88	(377)
Single or separated	12	(50)
Parity		
Para 1	19	(84)
Para 2-4	54	(231)
Para 5+	27	(115)
Gestational age at day of interview		
<20 weeks	14	(60)
20-24 weeks	43	(185)
25-27 weeks	3	(14)
28-32 weeks	30	(128)
>32 weeks	10	(43)
No. of women attending the first time	56	(241)
No. of women attending the second time	27	(117)
No. of women attending the third or more time	17	(72)

*does not add up to 100% due to missing values

5.4.2. Knowledge about IPTp among health workers

Health workers' awareness about the IPTp strategy was high, but concentrated on the *restrictive* IPTp schedule. The majority of interviewees (11/18) explained in line with the *restrictive* IPTp guidelines, that IPTp should be administered between 20-24 weeks and 28-32 weeks of gestation, or in the fifth and seventh months. However, some health workers were confused as to when and how many doses of IPTp to administer. A third of the health workers (7/18) reported a deviant IPTp schedule: two health workers who were working in the same health facility indicated that they start giving the first SP dose after 16 weeks of gestation; another three health workers coming from two health facilities said they would give a total of three doses of SP, but were confused as to when to deliver them; three other health workers from different facilities reported giving SP up to the 34th and 36th week respectively. All seven health workers who reported deviant IPTp schedules stated that they had been instructed in a seminar to extend the schedule or increase the number of doses.

5.4.3. Knowledge and attitudes about malaria prevention among pregnant women

Awareness about IPTp was not high among the pregnant women interviewed. 34% (148/430) of the pregnant women mentioned IPTp spontaneously as a service that they should receive at the ANC clinics. Asking the participants specifically about means of malaria prevention that they expect to get at the ANC clinic, SP/Fansidar/antimalarial was stated by 64% (277/430). 17% (75/430) did not know. Most women were aware that they get malaria prevention for their own (13%, 56/430) or for the child's protection (27%, 118/430) or for both mother and child (36%, 155/430). However, almost a quarter of the participants (23%, 99/430) answered the question "why do they provide you with malaria prevention when you go to the ANC clinic" with "I don't know".

5.4.4. Pregnant women's timing of ANC visits

Pregnant women's ANC attendance was in line with the *restrictive* IPTp schedule as most of them attended at 20-24 and 28-32 weeks of gestation. Figure 7 presents pregnant women's gestational age at their first, second, third and fourth ANC visit. It illustrates that the majority of women (57%, 247/430) were already between 20-24 gestational weeks at their first visit. Median gestational age at the first visit was 20 weeks which is consistent with the national average of 20.1 gestational weeks among health facility users (Marchant et al., 2008a). Around half of the women were between 28-32 weeks of gestation at their second, third or fourth visit.
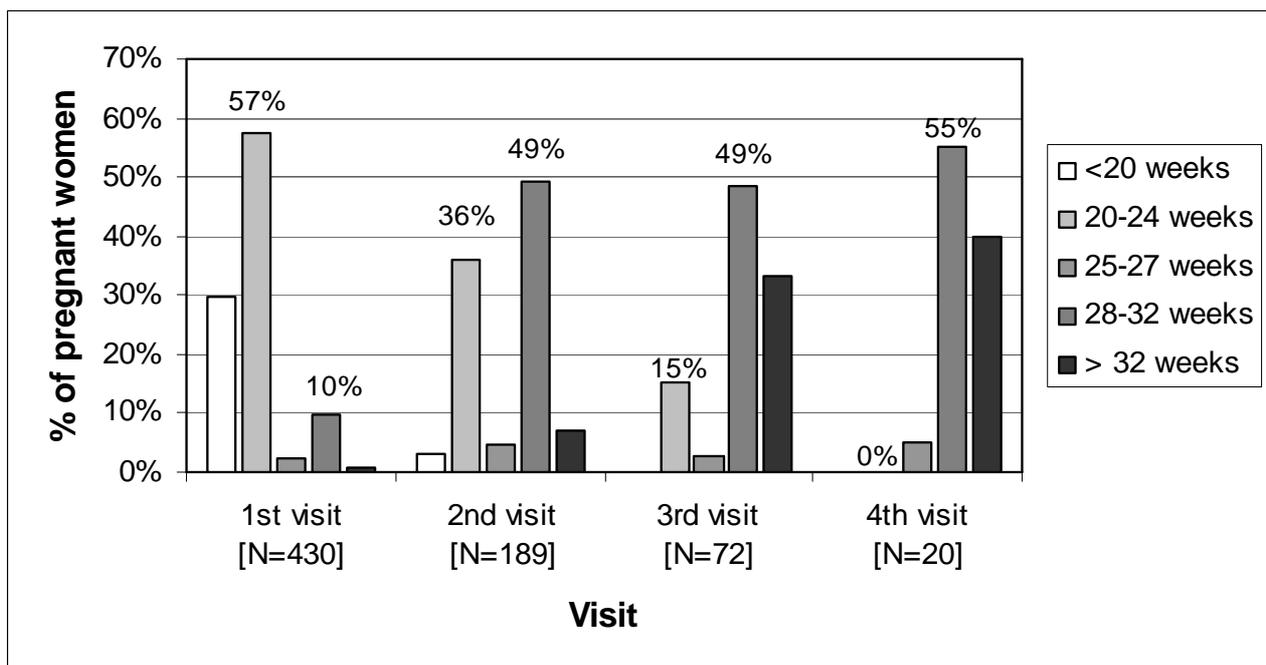
Figure 7: Women's attendance by gestational age and visit

The majority of pregnant women attended at least once during a time period in which they were eligible for a first and/or a second IPTp dose at their ANC visits (Figure 8). The number of visits made during the two IPTp delivery periods specified by the *restrictive* guidelines was analysed for the two sub-samples of women of at least 20 and 28 weeks of gestation. 81% (299/370) of the women at 20 and more weeks of gestation attended the ANC clinic in a way that they were at least once eligible for a first dose of IPTp between 20-24 weeks. 15% (55/370) were not eligible for IPTp because they delayed ANC attendance until after 24 weeks of gestation. Among the women who were at least 28 weeks of gestation 92% (157/171) were eligible at one or more ANC visits for an IPTp dose between 28-32 weeks of gestation. The fact that only 8% of the women did not attend between the 28-32 weeks of gestation indicates that visits were more timely during the second delivery period compared to the first delivery period. Analysis for all women who had reached 28 weeks of gestation showed that 60% (102/171) attended both between 20-24 and 28-32 weeks of gestation and were therefore eligible for two doses of IPTp.
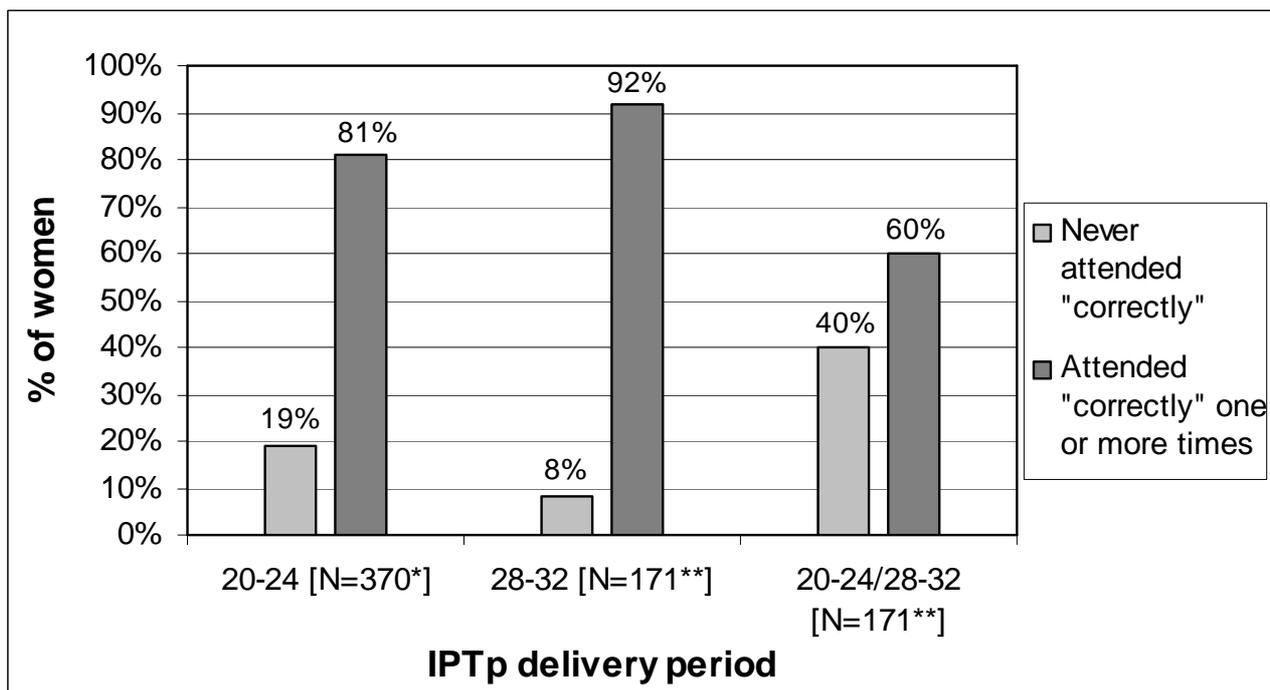
Figure 8: Women's timely attendance according to the restrictive guidelines
*No. of women of at least 20 weeks of gestation, **No. of women of at least 28 weeks of gestation

In summary, this analysis shows that women attended in accordance with the *restrictive* guidelines and ANC attendance initiated later than 24 weeks of gestation was low. Thus, the majority of women attended at the right time to receive IPTp during the two IPTp delivery periods.

5.4.5. Health workers' IPTp delivery and its timing

ANC card records showed that delivery coverage was high for one IPTp dose but low for the complete course of two IPTp doses. Table 2 illustrates that among the women who were 20 weeks of gestation and older, 21% (79/370) had not yet received any IPTp dose and 79% (291/370) were given one or more doses of IPTp. However, only 27% (46/171) of the women who were at least 28 weeks of gestation had received two or more doses.

Table 2: IPTp delivery

Characteristic	%	(n/N)
Use of IPTp-SP		
None	21.4	(79/370)*
At least one	78.7	(291/370)*
At least two	26.9	(46/171)**
Gestational age at 1st IPTp-SP dose		
<20 week	4.7	(14/299)
20-24 weeks	72.9	(218/299)
>24 weeks	22.4	(67/299)
Gestational age at 2nd IPTp-SP dose		
<28 weeks	11.8	(6/51)
28-32 weeks	84.3	(43/51)
>32 weeks	3.9	(2/51)
*No. of women of at least 20 weeks of gestation, **No. of women of at least 28 weeks of gestation		

Analysis of IPTp delivery by women's gestational age showed that the timing of the IPTp delivery was in accordance with the *restrictive* IPTp guidelines (Table 2): most women received IPTp during the specific periods of 20-24 and 28-32 weeks of gestation. 73% (218/299) of the women who had received a first dose of IPTp got it between 20-24 weeks; 5% (14/299) received it before and 22% (67/299) after this period. Among the women who had received a second dose of IPTp, 84% (43/51) got it between 28-32 weeks of gestation. Among the total SP doses administered to pregnant women only 11% (38/352) were distributed outside the two delivery periods.

However, although most women attended the ANC clinics during the required periods of 20-24 and/or 28-32 weeks of gestation, several women did not receive IPTp from the health workers, especially when attending between 28-32 weeks of gestation. Using data from the two subgroups, Table 3 reports the number of women who attended ANC on time to be eligible for a dose of IPTp and actually received IPTp. Among the women who were at least 20 weeks of gestation, 81% (299/370) attended between 20-24 weeks. Out of those, 73% (218/299) received IPTp when they attended between 20-24 weeks. Among the women who

were at least 28 weeks of gestation, 92% (157/171) of the women attended the ANC clinics at least once between 28-32 weeks. However, only 55% (87/157) of them got an IPTp dose either as a first or a second dose. This suggests that health workers deliver IPTp significantly less well between 28-32 week of gestation than between 20-24 weeks (55.4% vs. 72.9%; p<0.001). Consequently, the coverage for two doses of IPTp was low: among those who attended during both IPT delivery periods (at 20-24 weeks and 28-32 weeks of gestation) only 30% (30/102) actually received two doses of IPTp.

Table 3: Women's timing of ANC attendance and SP delivery

	No. of women attending between 20-24 weeks and/or 28-32 weeks of gestation at any visit		No. of women receiving SP between 20-24 weeks and/or 28-32 weeks of gestation at any visit	
	% (CI 95%)	n/N	% (CI 95%)	n/N
20-24 weeks of gestation	80.8 (76.4-84.7)	299/370*	72.9 (67.5-77.9)	218/299
28-32 weeks of gestation	91.8 (86.6-95.5)	157/171**	55.4 (47.3-63.3)	87/157
20-24 AND 28-32 weeks of gestation	59.7 (51.9-67.1)	102/171**	29.4 (14.7-49.4)	30/102

*No. of women of at least 20 weeks of gestation, **No. of women of at least 28 weeks of gestation

To summarize, analysis of health workers' IPTp delivery showed that they adhered well to the *restrictive* guidelines as far as timing of IPTp delivery is concerned. However, women attending ANC clinics between 28-32 weeks of gestation were 24% (100%-55.4%/72.9%) less likely to receive a dose of IPTp than women attending between 20-24 weeks of gestation. Consequently, second dose coverage was low.

5.4.6. IPTp guidelines compared

Opportunities to reach high IPTp coverage levels were not only missed because of undelivered IPTp doses at the health facilities, but also due to the poor implementation of the IPTp strategy. In fact, these two aspects may be closely interlinked. Although WHO's simplified IPTp schedule from 2004 has been integrated into the Tanzanian FANC guidelines the same year, health workers at the ANC clinics still followed the former IPTp policy and administered IPTp during two restrictive periods in 2007 and 2008. Using the information on number and timing of ANC visits and received IPTp doses among the study population, an estimate of the increase in IPTp coverage that could potentially have been gained by implementing the *simplified* WHO guidelines was calculated. Table 4 summarizes the additional number of women from the survey sample who would have been eligible to IPTp according to the *simplified* IPTp guidelines recommended by the WHO compared to the

restrictive IPTp schedule currently practiced at the ANC clinics. Women's first visit was analysed to assess the additional number of women eligible for one IPTp dose and women's first two, three and four visits were examined to assess the number of additional women eligible for two doses of IPTp. Among the women who attended the ANC clinic for the first time, a significantly higher proportion of women would have been able to receive one IPTp dose (69% vs. 57%, p<0.001). At the first two visits, IPTp coverage could have been increased by 19 percentage points (p<0.001); and at the first three visits by 20 percentage points (p<0.001) by adhering to the *simplified* guidelines. At the level of four ANC visits no difference between the two guidelines was observable due to the small sample size (N=20). Furthermore, according to the *simplified* guidelines health workers would not only have been able to deliver two IPTp doses at the right time to more women, but could also have administered more than two IPTp doses to 20% (37/189) of the women who attended the ANC clinic at least twice.

Table 4: Number of women eligible for IPTp according to the two guidelines

	Restrictive guidelines (20-24, 28-32 weeks of gestation)		Simplified guidelines (20-40 weeks of gestation, one month apart)		
	% (95% CI)	n/N	% (95% CI)	n/N	p-value*
Visits	No. of women eligible for one dose of IPTp				
First visit	57.4 (52.6-62.2)	247/430	69.5 (64.9-73.8)	299/430	<0.001
	No. of women eligible for at least two doses of IPTp				
First two visits	40.2 (33.2-47.6)	76/189	59.3 (51.9-66.3)	112/189	<0.001
First three visits	70.8 (58.9-80.9)	51/72	90.3 (81.0-96.0)	65/72	<0.001
First four visits	90.0 (68.3-98.7)	18/20	95.0 (75.1-99.9)	19/20	1.0

* P-values based on chi-square test and Fishers exact test at four visits

In summary, through the implementation of the *simplified* guidelines recommended by WHO IPTp coverage at their first, second and third ANC visits could have been increased by 12 to 20 percentage points. Moreover, the number of delivered doses of IPTp could be increased.

5.4.7. Lost effectiveness of IPTp strategy

Women's timing of ANC attendance, health workers' IPTp delivery and policy issues all influence IPTp coverage levels. Based on the collected ANC record data, Figure 9 illustrates the impact of these bottlenecks on the effectiveness of the IPTp strategy for the two available IPTp guidelines (*restrictive* vs*. simplified*): Out of 189 women who made at least two ANC

visits, 7% started ANC attendance too late to receive the first IPTp dose timely according to the *restrictive* guidelines. According to the *simplified* guidelines all of them would have received IPTp in time. 54% (102/189) of the women who made two or more ANC visits, would have been eligible for two IPTp doses according to the *restrictive* guidelines while 75% (141/189) of them attended timely according to the *simplified* guidelines (p<0.001). Given the current IPTp delivery practices observed among health workers, 45% (85/189) of the women were given at least one dose of IPTp and 16% (31/189) were given two doses of IPTp at the correct time according to the *restrictive* guidelines. Applying the *simplified* guidelines, 61% (115/189) received at least one dose and 22% (42/189) at least two doses of IPTp at the right time. This indicates that effectiveness of the IPTp strategy is lost especially through policy issues and health worker practices.
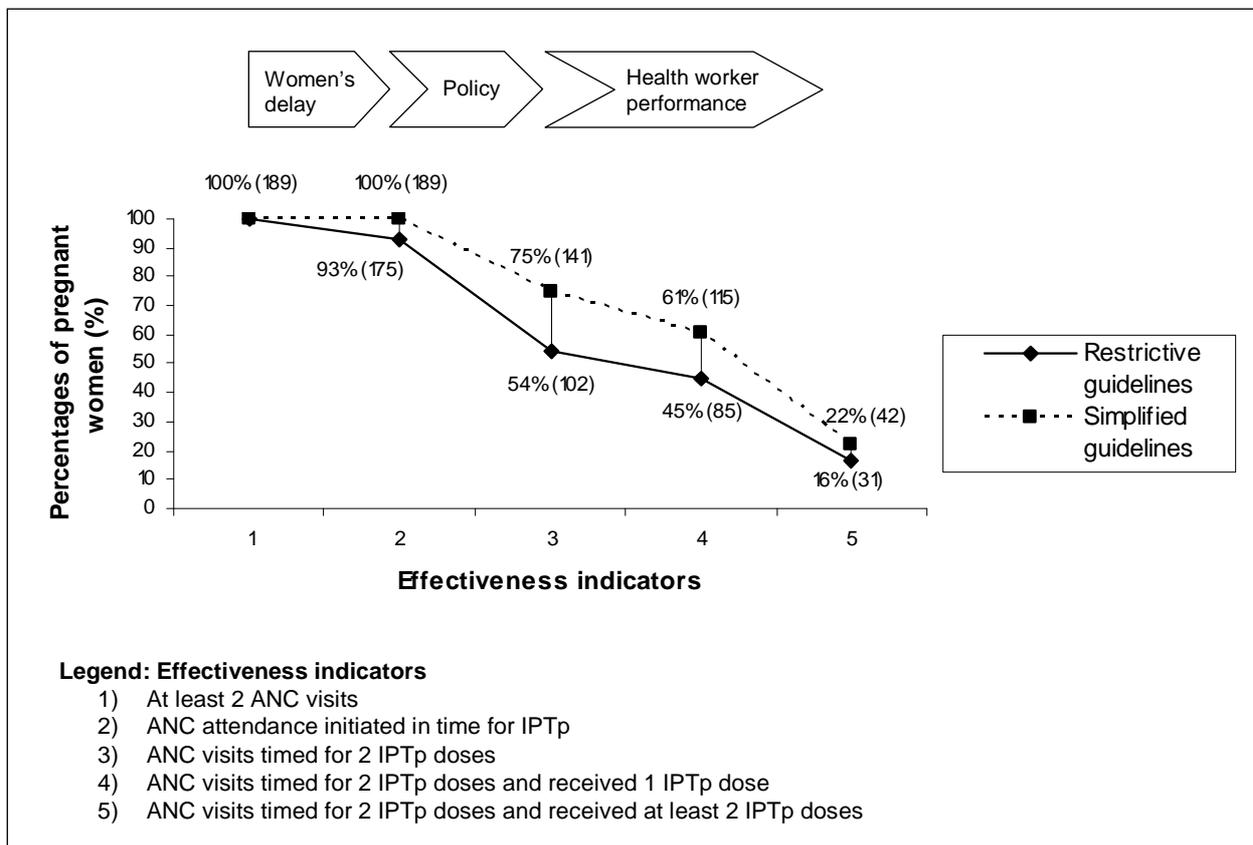
Figure 9: Effectiveness loss of the IPTp strategy due to individual, facility and policy factors

5.5. Discussion

The study illustrated the combined effect of women's timing of ANC attendance, health worker's IPTp delivery and different delivery schedules of national IPTp guidelines on IPTp coverage. This is in line with findings of previous studies from Tanzania showing that low IPTp coverage levels can not be attributed solely to women's late enrolment to ANC (Anders et al., 2008, Marchant et al., 2008b). Instead, health worker's IPTp delivery practices and unclear IPTp guidelines led to lost effectiveness of the IPTp strategy. Thus, solutions need to be found at individual, facility and policy level if the government of Tanzania aims at reaching at least 80% of pregnant women with two IPTp doses (MoHSW, 2006).

Compared to the *restricted* IPTp guidelines, pregnant women initiated ANC attendance late, but still in time to receive a first IPTp dose. Pregnant women in Tanzania are recommended to attend ANC clinics for the first time at 16 weeks of gestation (MoH and JHPIEGO, 2004). Most women started ANC attendance in their second trimester around 20 weeks of gestation. This is consistent with the national average among facility users (Marchant et al., 2008a) and with findings from other studies (Anders et al., 2008, Holtz et al., 2004, Marchant et al., 2008b, Nganda et al., 2004, Ouma et al., 2007). However, contrary to health workers' perception and assumptions in the literature (Brabin et al., 2009, Kiwuwa and Mufubenga, 2008, Launiala and Honkasalo, 2007, van Eijk et al., 2004), women's late ANC enrolment did not interfere with the IPTp schedule. This has also been stressed by other studies (Anders et al., 2008, Marchant et al., 2008b, Ouma et al., 2007). Only 15% of the women started ANC attendance after 24 weeks of gestation and were therefore according to the *restrictive* guidelines no longer eligible for a first dose of IPTp. Overall, women's timing of ANC visits matched well with the *restrictive* IPTp schedule that was practiced in health facilities. The majority of the participants attended the ANC clinic at least once between 20-24 weeks and between 28-32 weeks of gestation. This shows that women's ANC attendance follows health workers' instructions and was not the main cause for low IPTp levels. IPTp coverage could theoretically have been high. The high proportion of women attending during the specific periods is not surprising as women are given return dates by the health workers. Although women's knowledge about the timing of IPTp was not investigated, it can be presumed that women rely on health workers to correctly administer drugs (Brabin et al., 2009, Spangler and Bloom, 2010). Findings of Marchant et al. (2008b) support this assumption: over 90% of the women who had not received a dose of IPTp said that health workers had not offered it to them. The participants' knowledge on malaria prevention and its effects was not very high. Almost a quarter of the women did not know why they were supposed to get malaria prevention at the ANC clinic. Pregnant women's knowledge concerning IPTp but also

women's power and ability to actively demand IPTp and to protect themselves from erratic timing or missed delivery of IPTp (van Eijk et al., 2005) needs to be improved.

Health workers' IPTp delivery was characterized by its focus on the *restrictive* IPTp guidelines and by low delivery levels between 28-32 weeks of gestation. Timing of IPTp delivery was in accordance with the *restrictive* IPTp schedule as most IPTp doses were delivered within the specified periods of 20-24 weeks and 28-32 weeks of gestation. Only 11% of the total IPTp doses were administered outside these periods. Awareness of the IPTp strategy was high among the health workers, however, the concurrent existence of different IPTp guidelines led to some confusion about when and how many IPTp doses to administer. Consistent with findings from several other studies (Anders et al., 2008, Gikandi et al., 2008, Kiwuwa and Mufubenga, 2008, Marchant et al., 2008a, Ouma et al., 2007), most women in the study got a first dose of IPTp, but many did not receive a complete course of two IPTp doses. HMIS data collected in the study area in 2008 provided a similar picture: less than half of the women who were given a first IPTp dose, also received a second one. Health workers' low performance provides one possible explanation (Ndyomugyenyi and Katamanywa, 2010, van Eijk et al., 2004): Observations of ANC consultations in the context of a study on quality of care showed that return visits were usually of very short duration and reduced to the most basic examinations such as abdominal palpation and the measurement of blood pressure and weight (Gross et al., 2011b). In this context, IPTp as well as the delivery of other drugs and lab examinations might easily be skipped or forgotten. This pattern has also been reported in a study from Malawi (Launiala and Honkasalo, 2007). Given the shortages of SP often observed in Tanzania (Anders et al., 2008, Guyatt et al., 2004, Marchant et al., 2008b) health workers' rationing of SP, especially of the second IPTp dose, might represent another possible explanation. Information on SP stock-outs was not collected at the time of the study as it would only have served to explain the missed delivery of the most recent IPTp doses. Monitoring SP stocks at the health facilities through the collection of end of month drug stock data was not possible due to low quality of record keeping by the facility staff. However, a quality of care study conducted in October 2008 in the same area showed that all the selected health facility except one had SP available in the three preceding months (unpublished data, ACCESS Programme). As this study leaves open questions on why health workers delivered the second IPTp dose significantly less well than the first one, it calls for future studies on health workers IPTp delivery practices.

IPTp delivery practices at ANC clinics in the study area and other regions of Tanzania differ critically from the *simplified* WHO recommendations to distribute SP to all pregnant women twice after quickening and one month apart (Anders et al., 2008, Marchant et al., 2008b). The government's failure to implement the *simplified* IPTp schedule caused on the one hand confusion among health workers due to the concurrent existence of different and contradictory IPTp policies. On the other hand it represents a missed opportunity for high coverage levels of this important intervention. Calculations based on the *simplified* guidelines suggest that IPTp coverage could potentially be increased by up to 20 percentage points if IPTp delivery were no longer limited to the narrow gestational range of 20-24 and 28-32 weeks. Better outcomes are also to be expected as health workers' difficulties to assess gestational age is taken into account (Gies et al., 2008).

The Ministry of Health should therefore overcome inconsistent IPTp messages and advocate one clear IPTp recommendation. The study showed that implementing the *simplified* IPTp policy recommended by WHO has the potential to reach more pregnant women with the important intervention of IPTp. The fact that the *simplified* IPTp guidelines are already integrated in the Focused Antenatal Care guidelines highlights the need for training health workers on the new policy and disseminating the information to the periphery.

Not only coverage but also the number of administered doses could be easily increased through the implementation of the *simplified* guidelines. WHO currently recommends a three dose regimen for areas in which antenatal HIV prevalence exceeds 10% and where HIV-testing is not available (Ter Kuile and Steketee, 2007). Trials from Kenya, Malawi and Zambia showed that receiving at least three courses of IPTp was associated with a better protective outcome among HIV-positive pregnant women (Filler et al., 2006, Gill et al., 2007, Hamer et al., 2007, Parise et al., 1998). Tanzania so far continues with a two-dose regimen due to its relatively low HIV prevalence rates. However, if levels of parasite resistance continue to increase, alternative drugs for IPTp need to be urgently found (Vallely et al., 2007). Any replacement drug to SP will most likely require a more complicated drug regimen. Thus, achieving high coverage levels will become even more challenging.

Collecting data through exit interviews at health facilities imposed two main limitations on the study: Firstly, information on women's ANC attendance behaviour was incomplete. Most women were at the beginning or at the middle of their pregnancy and data were usually available for less than four ANC visits. Moreover, although data collection took place over

several months and at different ANC clinics it might not be representative for other places and periods of the year. Secondly, the conduct of exit interviews may have resulted in improved health worker performance. Including ANC card data on services received at earlier visits certainly lessened this type of bias. In reality, having a record of IPTp receipt is neither a guarantee that the drug was given nor taken – despite the fact that IPTp should be provided under direct observation. However, comparing ANC records with women's self-report revealed no major inconsistencies. Finally, between the interviews with the health workers and the exit interviews with ANC attendees was a time gap of one year, since the exit interview survey was conducted in order to verify and validate certain results from the health worker interviews. Although health workers did not receive any training on IPTp delivery in the meantime, the time order of the studies did not allow to investigate health workers' reasons for the lower level of second dose IPTp delivery.

5.6. Conclusions

This study showed that effective IPTp delivery to pregnant women is hampered by the combined effect of women's timing of ANC attendance, health worker's IPTp delivery and different delivery schedules of national IPTp guidelines. In particular, the implementation of *simplified* IPTp guidelines will be critical for reaching the 80% target. Training on *simplified* IPTp messages should be reinforced as part of the extended FANC training of health workers to change IPTp delivery practices and increase coverage levels. Additionally, campaigns that provide educational messages on the risk of malaria during pregnancy and the usefulness of IPTp and that help to raise patients' awareness for their rights are required to increase pregnant women's power to demand IPTp and other ANC services and decrease their dependence on health workers. Lessons need to be learned on how to implement guidelines changes effectively and determinedly in order to be prepared for the implementation of a new drug for IPTp when drug resistance against SP has reached levels where IPTp with SP is no longer efficacious.

5.7. Authors' contributions

KG was responsible for the design and implementation of the study, carried out the data collection, the data management and analysis, and wrote the manuscript. SA assisted with data management, statistical analysis and contributed to the interpretation and discussion of the findings in the manuscript. IM participated in the study design and data collection process and commented on the manuscript. BO, FK and JS supported the design and coordination of the study and contributed to the discussion of the manuscript. All authors have read and approved the final manuscript.

5.8. Competing interests

The authors declare that they have no competing interests.

5.9. Acknowledgements

6. Timing of antenatal care for adolescent and adult pregnant women in south-eastern Tanzania

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6.1. Abstract

6.1.1. Background

Early and frequent antenatal attendance during pregnancy is important to identify and mitigate risk factors in pregnancy and to encourage women to have a skilled attendant at childbirth. However, many pregnant women in sub-Saharan Africa start antenatal care attendance late, particularly adolescent pregnant women. Therefore they do not fully benefit from its preventive and curative services. This study assesses the timing of adult and adolescent women's first antenatal care visit and identifies factors influencing early and late attendance.

6.1.2. Methods

The study was conducted in the Ulanga and Kilombero rural Demographic Surveillance area in south-eastern Tanzania in 2008. Qualitative exploratory studies informed the design of a structured questionnaire. A total of 440 women who attended antenatal care participated in exit interviews. Socio-demographic, social, perception- and service related factors were analysed for associations with timing of antenatal care initiation using regression analysis.

6.1.3. Results

The majority of pregnant women initiated antenatal care attendance late with an average of 5 gestational months. Belonging to the Sukuma ethnic group compared to other ethnic groups such as the Pogoro, Mhehe, Mgindo and others, perceived poor quality of care, late recognition of pregnancy and not being supported by the husband or partner were identified as factors associated with a later antenatal care enrolment ($p<0.05$). Primiparity and previous experience of a miscarriage or stillbirth were associated with an early antenatal care attendance ($p<0.05$). Adolescent pregnant women started antenatal care no later than adult pregnant women despite being more likely to be single.

6.1.4. Conclusions

Factors including poor quality of care, lack of awareness about the health benefit of antenatal care, late recognition of pregnancy, and social and economic factors may influence timing of antenatal care. Community-based interventions are needed that involve men, and need to be combined with interventions that target improving the quality, content and outreach of antenatal care services to enhance early antenatal care enrolment among pregnant women.

6.2. Background

Maternal death has declined substantially worldwide except in Sub-Saharan Africa (Hogan et al., 2010). Of the 21 countries with the highest maternal mortality 15 are in sub-Saharan Africa, including Tanzania (Hogan et al., 2010). In 2010, pregnancy and childbirth-related complications led to an estimated 454 maternal deaths per 100'000 live births in Tanzania (NBS and ICF Macro, 2011). Most of these complications occur unpredictably during labour, delivery and the immediate postpartum period (Ronsmans and Graham, 2006). Deaths could be averted with prompt and adequate diagnosis and care (Campbell and Graham, 2006). However, 49% of all women in Tanzania still deliver at home without any skilled attendant (NBS and ICF Macro, 2011). Moreover, according to the definition of the World Health Organisation (WHO) (WHO, 2006) a quarter of all women in Tanzania begin childbearing as adolescents before reaching the age of 20 years (NBS and ICF Macro, 2011). An estimated 70'000 adolescent mothers die each year worldwide because their bodies are not yet physically ready for motherhood and due to social disadvantages (Bearinger et al., 2007, Mayor, 2004). Pregnancy and childbirth thus constitutes the number one killer among 15-19 year old girls worldwide (WHO, 2006).

Several studies have shown that women who started antenatal care (ANC) attendance early and attended frequently were more likely to be assisted during delivery by a skilled attendant compared to those who initiated ANC late and attended only few visits (Abou-Zahr and Wardlaw, 2003, Bloom et al., 1999, Mpembeni et al., 2007, Rockers et al., 2009). Although ANC might not have the potential to predict and avert obstetric emergencies during pregnancy and childbirth, it exposes women to health education on risk factors and encourages them to deliver with a skilled attendant or in a health facility. Recent studies have suggested that women who knew about risk factors were more likely to utilize health facilities for delivery than those without knowledge (Mpembeni et al., 2007, Stekelenburg et al., 2004). Moreover, ANC provides the opportunity to detect and treat anomalies of pregnancy and to deliver preventive health services such as immunization against tetanus, prophylactic treatment of malaria and worms, and HIV testing and counseling (leading to Preventing Mother to Child Transmission of HIV, PMTCT) (Villar and Bergsjo, 2002). To fully benefit from these interventions, it is important that women start ANC early on in their pregnancy. The revised Focused Antenatal Care (FANC) model of WHO (Villar and Bergsjo, 2002) as well as the Tanzanian FANC guidelines (MoH and JHPIEGO, 2004) recommend at least four ANC visits for uncomplicated pregnancies with the first visit starting before 16 weeks of gestation

(Villar and Bergsjo, 2002). However, an analysis of Demographic and Health Surveys (DHS) from 45 developing countries showed that women in sub-Saharan Africa start antenatal care considerably later than women from other regions (Abou-Zahr and Wardlaw, 2003). Similarly, other studies reported late ANC enrolment after more than five months of gestation in sub-Saharan African countries (Kiwuwa and Mufubenga, 2008, Magadi et al., 2000, Ndidi and Oseremen, 2010, Okunlola et al., 2006), including Tanzania (Marchant et al., 2008a, Mpembeni et al., 2007, Mrisho et al., 2009, NBS and ICF Macro, 2011). A comparative analysis of the use of maternal health services in sub-Saharan Africa showed that adolescent mothers initiated ANC attendance even later and had poorer maternal health care than adult mothers (Magadi et al., 2007).

Quantitative studies on timing of ANC attendance from developing countries have been able to shed light on the influence of socio-demographic factors. Although there is mixed evidence, late booking of antenatal care has repeatedly been associated with young age (Adekanle and Isawumi, 2008, Magadi et al., 2007, McCaw-Binns et al., 1995, McCray, 2004), premarital status (Magadi et al., 2007, McCaw-Binns et al., 1995), unwanted pregnancies (Magadi et al., 2000, Marston and Cleland, 2003, McCaw-Binns et al., 1995), high parity (Adewunmi et al., 2009, Magadi et al., 2007, Magadi et al., 2000, Matthews et al., 2001, McCaw-Binns et al., 1995), lack of formal education (Adekanle and Isawumi, 2008, Magadi et al., 2007, Matthews et al., 2001, McCaw-Binns et al., 1995), low socio-economic status (SES) (Magadi et al., 2000, McCaw-Binns et al., 1995) and ethnicity (Magadi et al., 2000, Matthews et al., 2001). Less is known about the influence of social and cultural determinants on prenatal care use among adult and adolescent pregnant women (Ryan et al., 2009). Qualitative as well as quantitative studies have stressed the influence of social support from family members (McCray, 2004, Simkhada et al., 2010, van Eijk et al., 2006). A study from Nepal for example reported the important role of mothers-in-law in deciding about ANC use of their pregnant daughters-in-law (Simkhada et al., 2010). Studies from Uganda showed that adolescents were more likely to experience violence from parents, to be rejected by their partner, expelled from school, and to be stigmatized (Atuyambe et al., 2008, Mbonye et al., 2006), and therefore to hide their pregnancy (Mbonye et al., 2006). Late recognition of and uncertainty about the pregnancy (Jewkes et al., 1998a, Launiala and Honkasalo, 2007, Myer and Harrison, 2003), as well as cultural beliefs and practices around pregnancy (Chapman, 2003, Haws et al., 2010, Launiala and Honkasalo, 2007, Myer and Harrison, 2003), have been reported to influence women's timing of ANC attendance. Ethnographic studies from Mozambique and southern Tanzania illustrated for example that women at an

early stage of pregnancy delayed ANC initiation purposely in order to protect the unborn from witchcraft and sorcery attacks of jealous neighbours and kin (Chapman, 2003, Haws et al., 2010). Other studies showed that women's ANC attendance is mediated by their experiences and the quality of care at earlier ANC visits (Ndyomugyenyi et al., 1998, Audo et al., 2005). These studies clearly indicate that beyond demographic and socio-economic factors, social and cultural factors as well as individual perception of pregnancy and care impact women's timing of ANC enrolment. Unfortunately, data are often not disaggregated by age, thus hiding particular vulnerabilities and issues (Bearinger et al., 2007).

Exploratory studies carried out in the study area in 2007 as a preparation for this study confirmed several of the factors stressed in the literature. In semi-structured interviews (Gross et al., 2011a), health workers reported that women, and in particular women from the ethnic group of the Sukuma – semi-nomadic pastoralists who started to migrate into the region in the 1980s (Haddelsey et al., 1997) – initiated ANC attendance late and underutilized ANC due to lack of education and living in distant settlements. Data collected between 2007 and 2009 from the Health Management Information System (HMIS) of the health facilities within the study area indicated that the proportion of pregnant women who initiated ANC attendance after the fifth month of gestation rose from 53% to 56% between 2006 and 2008. Over this period, 18% of all ANC attendees were 19 years old or less. In an in-depth study with a small sample of recent adult and adolescent mothers (Gross 2007, unpublished data), adolescent women were found to visit the ANC clinic later and less frequently than adult women. Moreover, adolescent mothers differed from adult mothers in several ways: most of them were in their first pregnancy which was unplanned and prior to marriage, they still lived at their parents' home and they did not get any social or economic support from their partner or the child's father.

Based on the insights from the literature review and the exploratory studies, three main research questions arose that are addressed in this paper: First, do pregnant women – and in particular adolescent pregnant women – start ANC attendance late? Second, what factors are associated with early or late ANC attendance? And finally, do adolescent pregnant women differ from adult pregnant women in terms of social and economic support?

6.3. Methods

6.3.1. Study setting

Data collection took place in the Kilombero and Ulanga rural Demographic Surveillance System (DSS) site in south-eastern Tanzania between June and October 2008. The area consists of 25 villages and has been extensively described elsewhere (Alba et al., 2010b, Hausmann Muela, 2000, Hetzel et al., 2007a, Schellenberg et al., 1999, Gross et al., 2011a, Armstrong Schellenberg et al., 2002). At the time of study, the area encompassed an estimated population of nearly 94,000 (Spangler and Bloom, 2010) and was served by a total of 13 first and second-level health facilities. Out of these, 12 (ten public health facilities and two faith-based) facilities provided ANC services on a weekly or daily basis from Monday to Friday. Two district hospitals outside the study area serve as referral centres for complicated cases. The local health system runs a cost-sharing scheme from which pregnant women and children under five years of age are exempted. Besides the biomedical system, traditional birth attendants and traditional healers provide alternative sources of prenatal and delivery care in the area (Spangler and Bloom, 2010).

6.3.2. Sample size and sampling procedures

A total of 440 pregnant women visiting an ANC clinic were recruited for a cross-sectional study using exit interviews. Ten facilities (nine government facilities and one faith based facility, five in the Kilombero district and five in the Ulanga district) were selected and visited for one day once per month. Since accessibility to health services in this rural context is constrained by seasonal conditions such as weather, agricultural work or availability of money, the exit interviews were conducted over several months. Two other health facilities in the study area (one government facility and one faith based facility) were not included in the study due to low levels of ANC attendance. On average, 12 randomly selected pregnant women were interviewed per visit (min-max: 1-21) adding up to a total of 43 pregnant women interviewed per health facility (min-max: 28-79). No formal sample size calculation was performed.

6.3.3. Data collection

Two trained local female field workers interviewed the women. A questionnaire was used including closed and some open ended questions. The design of the questionnaire was informed by insights from the exploratory studies as well as findings from the literature. Questions focused on a) socio-demographic characteristics, b) women's knowledge about ANC services, perceived quality of care and motivation to attend the ANC clinics, c) social and cultural factors, and d) ANC service utilization. Information on perceived quality of care

and health worker attitudes was only obtained from pregnant women who had attended an ANC clinic before the day of interview. Additionally, data on the number and timing of ANC visits received were copied from the ANC cards of all women. The questionnaire was designed in English, translated into Swahili, back-translated and pre-tested outside the study area.

6.3.4. Data analysis

Data from the exit interviews were double-entered using Microsoft Access, validated with EpiInfo version 3.3.2 (EpiInfo Association, Denmark) and analysed in Stata 10 (StataCorp, College Station, Texas, USA).

To answer the first research question – whether pregnant women attended late – the mean gestational age of the foetus at the first visit was calculated and compared to national guidelines. For the comparison of means, t-tests were used. For the second research question – what factors were associated with early or late ANC attendance – univariate and multivariate linear regression was used. All pre-specified variables with at least a 5% response in a category were included in the models. Two multivariate regression models were run. The first one included all variables and is reported in Table 7. Since the sample size was substantially decreased by the high number of missing values for the variables on perceived quality of care and perceived health worker attitudes (N=289), a second regression model excluding the two variables served as a sensitivity analysis (N=372). The gestational age of the foetus in months at the first ANC visit served as the outcome measure. Data on the gestational age of the foetus was collected in gestational weeks from the ANC cards but had to be transformed into gestational months (assuming one month to encompass four weeks) to get a normal distribution needed for the regression analysis. The regression assessed associations between the women's timing of ANC initiation and socio-demographic, social, perception- and service related variables. Associations between variables were assessed with logistic regression models. To answer the third research question – whether adolescent pregnant women differed from adult pregnant women in terms of social and economic support – logistic regression models were fitted to understand associations between adolescent-hood and social and economic support received during pregnancy.

6.3.5. Ethical considerations

The study was conducted within the frame of the ACCESS Programme which was cleared by the National Institution for Medical Research of Tanzania (NIMR/HQ/R.8c/Vol. I/66) (ACCESS Programme, 2008a). Approval was further provided by the review boards of the Swiss Tropical and Public Health Institute (SwissTPH) and the Ifakara Health Institute (IHI).

The study was authorized by the district coordinators of Reproductive-and-Child-Health (RCH) and the health facility staff granted permission to conduct the study at their facilities. All study participants provided oral informed consent after having been explained the purpose of the study and informed of their right to withdraw from the study at any time.

6.4. Results

6.4.1. Study population

Out of the 440 pregnant women who participated in the cross-sectional study, 35 women were excluded - 10 women because their ANC cards did not contain information on gestational age and 25 because information on their age was missing. The final sample consisted of a total of 405 participants, including 61 (15%) adolescents aged 19 years or younger. Table 5 summarizes the characteristics by age groups. The median age of all respondents was 25 years (Inter-quartile range (IQR)=21-31) and 18 years (IQR=17-19) among adolescents. Of all women interviewed, 20% were in their first pregnancy (primiparity); the median number of pregnancies was 3 (IQR=2-5, including the current pregnancy). Among adolescent women, 79% were pregnant for the first time, and the median number of pregnancies was 1 (IQR=1-1). A quarter of women (25%) reported a history of miscarriage or stillbirth. Most women (88%) were married or lived in a consensual union and 55% had completed 7 years of primary school. Women belonged to a wide mix of ethnic groups with the Pogoro (19%), Sukuma (17%), Mhehe (10%) and Mgindo (9%) being the most common.

Table 5: Characteristics of the sample

Categories	Total sample			Sample of adult women			Sample of adolescent women		
	N	n	%	N	n	%	N	n	%
Socio-demographic characteristics									
Age	405			344			61		
<20 years		61	15					61	100
20-34 years		288	71		288	84			
35-49 years		56	14		56	16			
Parity	405			344			61		
1		82	20		34	10		48	79
2-4		218	54		205	60		13	21
5+		105	26		105	30			
Marital status	404			343			61		
Married/Consensual union		357	88		315	92		42	69
Single or separated		47	12		28	8		19	31
History of abort/stillbirth	402			342			60		
Abort/stillbirth		99	25		95	28		4	7
No abort/stillbirth		303	75		247	72		56	93
Education level	405			344			61		
No or imcomplete education		180	45		156	46		24	39
Primary +		222	55		185	54		37	61
Ethnicity	405			344			61		
Sukuma		68	17		55	16		13	21
Other ethnic group		337	83		289	84		48	79

Table 5: continued

Categories	Total sample			Sample of adult women			Sample of adolescent women		
	N	n	%	N	n	%	N	n	%
ANC knowledge and perception									
Perceived ANC starting time	383			327			56		
Within first 3 months		256	67		222	68		34	61
After first 3 months		127	33		105	32		22	39
Knowledge of services	405			344			61		
Low		314	78		260	76		54	88
High		91	22		84	24		7	12
Perceived service quality	319			266			53		
Good		292	91		241	91		51	96
Bad		27	9		25	9		2	4
Perceived health worker attitudes	310			258			52		
Good		291	94		239	93		52	100
Bad		19	6		19	7			
Traditional medicine use	402			341			61		
Yes		37	9		31	9		6	10
No		365	91		310	91		55	90
Pregnancy perception									
Early recognition of pregnancy	404			343			61		
Yes		284	70		240	70		44	72
No		120	30		103	30		17	28
Waiting for quickening	403			342			61		
Yes		108	27		94	27		14	23
No		295	73		248	73		47	77
Social and economic support									
Money [a]	404			343			61		
Yes		256	63		221	64		35	57
No		148	37		122	36		26	43
Advice received to attend ANC	404						61		
Yes		175	43	343	129	38		46	75
No		229	57		214	62		15	25
Accompanied to clinic	405			344			61		
Yes		196	48		162	47		34	56
No		209	52		182	52		27	44
Supported by husband	405			344			61		
Yes		380	94		324	94		56	92
No		25	6		20	6		5	8

6.4.2. Timing and reasons of ANC enrolment

Among the 405 pregnant women participating, only 29% initiated ANC attendance within the first four months of pregnancy as recommended by WHO (Villar and Bergsjo, 2002) and the Tanzanian FANC guidelines (MoH and JHPIEGO, 2004). Table 6 shows that overall pregnant women made their first ANC visit at a mean of 5.1 (Standard Deviation SD=1.2, range=2-9). Adolescent pregnant women started slightly earlier with a mean of 5.0 months (SD=1.2, range=2-8). It is noteworthy that the 13 multiparous adolescents in the sample initiated ANC attendance considerably later with an average of 5.5 (SD=1.20, t=1.43; p=0.157) gestational months (data not shown).

Table 6: Pregnant women's timing of ANC initiation

	Total sample			Sample of adult women			Sample of adolescent women		
Categories	N	Mean	SD	N	Mean	SD	N	Mean	SD
Mean gestational month at first ANC visit	404	5.1	1.2	344	5.1	1.2	61	5.0	1.2

When asked about their self-perceived timing of the first ANC visit, 56% of the participants said that they had made their first ANC visit late. Women who judged their first visit to be late attended ANC significantly later than women who perceived their first visit to be early (mean 5.5 gestational months vs. 4.7 months, t=6.92, p<0.001). Reasons given for late attendance were: not recognizing the pregnancy early (29%); poor accessibility due to distance, difficulties to cross rivers or poor road conditions (17%); not being able to come due to illness or other obligations such as traveling, caring for a sick person or agricultural work (14%); or negligence or apathy (13%). Women who said that they enrolled early in ANC did so in order to follow nurses' advise and because one is supposed to do so (37%); to know their health status and prevent health problems (31%); out of fear that the consequences of non-compliance would lead to not being treated or being scolded by the health facility staff (16%); or to treat a health problem (15%).

6.4.3. Determinants of timing of ANC enrolment

Socio-demographic factors

Table 7 shows the results of the univariate and multivariate linear regression for all women. Being in the first pregnancy was strongly associated with earlier ANC attendance. On average, primiparous women first visited ANC 0.89 month or three weeks earlier than multiparous women (p<0.001). On the other hand we found no evidence of an association between timing of ANC attendance and adolescent age (p=0.462). After adjusting for other factors, women who had a previous miscarriage or stillbirth attended 2 weeks earlier compared to women who had not experienced such an incident (p=0.007). Although univariate analysis for all ethnic groups revealed some slight differences in the timing of first ANC attendance (results not shown), it was only statistically significant for members of the ethnic group of the Sukuma. Multivariate analysis revealed that compared to all other ethnic groups, being a member of the ethnic group of the Sukuma had a strong delaying effect on ANC initiation of three weeks (p<0.001). There was no evidence that education (p=0.987) or marital status (p=0.532) were associated with an earlier or later timing of ANC attendance.

Knowledge and perception of antenatal care

Neither women who said that ANC attendance should be initiated within the first three months of pregnancy (67%) nor those who had a good knowledge about ANC services (22%) were found to start ANC attendance earlier than the others. Although only few women criticized the quality of ANC services (9%), multivariate analysis showed that those who did so initiated ANC attendance an average of three weeks later compared to those who were satisfied by the quality (p=0.009). Criticism was related to lack of services; being sent back home without receiving services due to the lack of sufficient staff; and having to purchase drugs, cards or diagnostic tests despite the national exemption policy that guarantees free health services for pregnant women. Surprisingly, perceived poor attitudes of health workers were associated with two weeks earlier attendance, although the effect was only marginally significant (p=0.082). Few women sought treatment from sources other than ANC (9%) which was not associated with a late ANC initiation. Univariate logistic regression models revealed that women who reported that they had visited a traditional healer were more likely to have had a history of a reproductive loss (OR= 2.90, p=0.003) or to belong to the Sukuma ethnic group (OR=1.96, p=0.09).

Table 7: Estimated effect of socio-demographic, social and perception- and service related factors on timing of pregnant women's first ANC visit in months

	Univariate			Multivariate (N=289)		
	Coeff[b]	(95% CI)	p-value	Coeff[b]	(95% CI)	p-value
Maternal factors						
Parity (N=405)						
Primi	-0.47	(-0.76, -0.18)	**0.002**	-0.87	(-1.32, -0.42)	**<0.001**
Multi[a]						
Adolescent/adult (N=405)						
Adolescent	-0.14	(-0.48, 0.19)	0.406	0.18	(-0.30, 0.65)	0.462
Adult[a]						
Marital status (N=404)						
Married/Consensual union[a]						
Single	0.01	(-0.36, 0.39)	0.947	0.15	(-0.33, 0.63)	0.532
History of abort/stillbirth (N=402)						
No abort[a]						
One or more abort	-0.23	(-0.51, 0.05)	0.107	-0.46	(-0.79, -0.13)	**0.007**
Education level (N=405)						
No formal education[a]						0.987
Primary +	-0.12	(-0.43, 0.19)	0.811	0.00	(-0.29, 0.29)	
Ethnicity (N=405)						
Sukuma	0.54	(0.23, 0.86)	**0.001**	0.82	(0.44, 1.19)	**<0.001**
Other ethnic group[a]						

[a] Reference category, [b] Estimated effect derived from linear regression on the timing of the first ANC visit expressed as gestational age in months (f.e. primiparious women started ANC on average 0.47 month earlier than multiparious women). The coefficients in the multivariate model are adjusted for all listed variables.

Table 7: continued

	Univariate			Multivariate (N=289)		
	Coeff[b]	(95% CI)	p-value	Coeff[b]	(95% CI)	p-value
ANC expectations, knowledge and perceived quality						
Perceived ANC timing (N=383)						
Within first 3 months[a]						
After first 3 months	0.09	(-0.17, 0.36)	0.498	-0.05	(-0.35, 0.24)	0.727
Knowledge of services (N=405)						
Low						
High[a]	0.30	(0.01, 0.59)	**0.042**	0.09	(-0.23, 0.41)	0.572
Perceived service quality (N=319)						
Good[a]						
Bad	0.79	(0.30, 1.27)	**0.002**	0.78	(0.20, 1.36)	**0.009**
Perceived health worker attitudes (N=310)						
Good[a]						
Bad	0.08	(-0.50, 0.67)	0.778	-0.57	(-1.21, 0.07)	0.082
Traditional medicine use (N=402)						
Yes	-0.31	(-0.73, 0.11)	0.142	-0.07	(-0.55, 0.41)	0.759
No[a]						
Pregnancy perception						
Early recognition of pregnancy (N=404)						
Yes[a]						
No	0.42	(0.16, 0.68)	**0.002**	0.47	(0.17, 0.77)	**0.002**
Waiting for quickening (N=403)						
Yes	0.21	(-0.06, 0.48)	0.130	0.15	(-0.15, 0.45)	0.323
No[a]						
Social and economic support						
Money (N=404)						
Yes[a]						
No	0.27	(0.02, 0.52)	0.036	0.28	(-0.02, 0.58)	0.064
Advised to attend ANC (N=404)						
Yes	-0.11	(-0.35, 0.14)	0.386	-0.11	(-0.40, 0.18)	0.449
No[a]						
Accompanied to clinic (N=405)						
Yes	-0.05	(-0.29, 0.20)	0.704	0.08	(-0.21, 0.37)	0.602
No[a]						
Supported by husband (N=405)						
Yes[a]						
No	0.60	(0.10, 1.10)	**0.019**	0.69	(0.05, 1.33)	**0.035**

[a] Reference category, [b] Estimated effect derived from linear regression on the timing of the first ANC visit expressed as gestational age in months. The coefficients in the multivariate model are adjusted for all listed variables.

Knowledge and perception of pregnancy

Almost a third of the women interviewed (30%) said that they had not recognized early that they were pregnant, some of them because of continued bleeding or previous use of contraception. Multivariate regression showed that women's late perception of pregnancy was independently associated with a later ANC start of 2 weeks (p=0.002). About a quarter of all women (27%) reported that they had waited for the foetus to move (quickening) before initiating ANC attendance. Although waiting for the quickening was not associated with a later ANC attendance (p=0.323) in the first regression model, it became marginally associated

(p=0.088) with a later ANC start of one week in the sensitivity analysis that also included women attending the clinic for the first time in their life (data not shown).

Social and economic support

Table 7 illustrates the negative influence of lacking social and economic support on the timing of ANC initiation: In particular not possessing money in cash when attending the ANC clinic (p=0.064) and not receiving support from the husband/partner (p=0.035) were independently associated with a later ANC enrolment in the multivariate analysis for all women. Women who had no money in hand attended on average about 1 week later and women who felt not supported by their husband attended almost 3 weeks later than women who did receive such support. In the sensitivity analysis – including women who attended the ANC clinic for the first time in their life – not possessing money in cash when attending the ANC clinic became significantly associated with a later start of one week (p=0.037) whereas there was no effect anymore for not receiving support from the husband/partner (p=0.149, data not shown).

6.4.4. Social and economic support for adolescent women

Table 8 shows that adolescent pregnant women were less likely to be married or to live with their partner than adult pregnant women (p<0.001). They were more likely to receive advice to attend the ANC (p<0.001) and to have received this advice from their mother, or a close person they called 'mother', rather than from their partner compared to adult women (data not shown, OR=9.83, p<0.001).

Table 8: Estimated effect of being an adolescent on social/economic support

	Adolescent women	Adult women[a]			
	n	n	OR[b]	(95% CI)	p-value
Social and economic support					
Marital status					
Married/Consensual Union[a]	42	315			
Single	19	28	5.09	(2.62-9.90)	**<0.001**
Money					
Yes[a]	35	200			
No	26	122	1.35	(0.77-2.34)	0.293
Advice received to attend ANC					
Yes	46	129	5.09	(2.73-9.48)	**<0.001**
No[a]	15	214			
Accompanied to clinic					
Yes	34	162	1.42	(0.82-2.45)	0.214
No[a]	27	182			
Supported by husband					
Yes[a]	56	324			
No	5	20	1.45	(0.52-4.01)	0.478

[a] reference category, [b] Estimated effect of being an adolescent on social and economic support derived from logistic regression

6.5. Discussion

This study showed that 71% of the pregnant women initiated ANC attendance after the recommended four months of pregnancy, at an average of 5.1 months (Table 6). This is consistent with the national average of 5 gestational months reported among facility users (Marchant et al., 2008a). A DSS household survey conducted in the study area around the same time found a similar average of 5.02 gestational months at women's first ANC visit (Spangler and Bloom, 2010).

Adolescent pregnant women have been reported to most likely either not attend ANC or to attend late and infrequently (McCaw-Binns et al., 1995, Magadi et al., 2007, van Eijk et al., 2006, WHO, 2006, Bearinger et al., 2007, Treffers et al., 2001) due to lack of knowledge, lack of power to take decisions, lack of money, or cultural factors including local concepts of illness (WHO, 2006). Contrary to the findings of these studies and our exploratory studies, we found no evidence of delayed attendance in adolescents (Table 6 and 7). In line with an early study from the US that reported lower prenatal care utilization among adolescents in their second pregnancy (Blankson et al., 1993) multiparous adolescents were found to start ANC attendance considerably later. Due to the study design of using exit interviews, we could only obtain information on women's timing of their first ANC visit and were unable to assess their overall utilization of ANC or even non-attendance. A study from Uganda comparing ANC attendance in adolescent and adult first time mothers found no difference in the timing of the first visit but a lower number of subsequent ANC visits in adolescents (Atuyambe et al., 2008). Similarly, Magadi et al. (2007) found more variation by age with regard to frequency of ANC attendance than with timing. Little is known about adolescents ANC attendance in Tanzania, suggesting studies are needed to investigate their overall attendance.

Second, insights into factors influencing pregnant women's timing of ANC have been provided. Besides primiparity, having a history of a previous reproductive loss was found to be a strong predictor for early ANC initiation in this study (Table 7). In accordance with other studies reporting that maternal care use varies across ethnic groups (Magadi et al., 2000, Spangler and Bloom, 2010), this study also found that the Sukuma ethnic group tended to have their first ANC visits later. Since Sukuma people live in very remote settlements of the study area, the effect is likely to be confounded by distance. GPS data is collected for each household within the DSS area, but unfortunately, it was not possible to merge this information with the demographic information collected during this study. Therefore neither data on distance between the homestead and the health facilities nor on women's socio-

economic status were available for analysis. Some studies have reported an association between maternal secondary education and early timing of ANC initiation (Ochako et al., 2011, Magadi et al., 2007). Contrary to these studies there was no evidence of such an effect in this study most presumably due to the overall low education level in the area, where few attend secondary school (see Table 5).

Women in this study were well aware whether they had initiated ANC attendance early or late, suggesting that confusion about the recommended starting time was not a problem. Few women (22%) could name more than four ANC services, but contrary to expectations, neither knowledge about correct ANC timing nor good knowledge of ANC services were associated with early ANC attendance (Table 7). Knowledge about available services might thus not imply that women are aware of the services' benefits. This matches with the surprisingly large number of women (53%) who indicated that they had attended ANC early because everyone does so, because of nurses' advice or because they feared the consequences of non-compliance with nurses' rules. In the exploratory study women indicated that their principal reason for attending the ANC clinic was to obtain an ANC card which was perceived as a necessary 'entry ticket' for services during delivery and illness rather than any conviction that ANC was good for their own or their child's health. The important pull factor of the ANC card has previously been reported by studies from Tanzania (Roth Allen, 2004, Mrisho et al., 2009), South Africa (Myer and Harrison, 2003), Malawi (Launiala and Honkasalo, 2007) and Uganda (Amooti-Kaguna and Nuwaha, 2000, Ndyomugyenyi et al., 1998). Attending ANC to obtain an ANC card thus might be one precautionary measure for women to conform to nurses' rules and to avoid harassment or informal payment requirements (Amooti-Kaguna and Nuwaha, 2000, Mushi, 2009). The extremely high rate of overall ANC attendance with 99.6% (Spangler and Bloom, 2010) and an average of 3.1 visits to ANC clinics over the course of their pregnancy (personal communication: M. Alexander) reported from the area, suggests that by creating threatening informal rules nurses successfully force women to attend the ANC clinics, however not necessarily at an early point of time. This is of course no reason to excuse nor to foster rude behaviour on the side of the nurses, but rather calls for better health education in health facilities, outreach services and in the community. Trained focal persons such as TBAs, religious leaders and other opinion leaders working as community volunteers in close collaboration with existing community structures and health services have been found to be effective promoters of obstetric care but also of early and frequent utilization of ANC in Southern Tanzania (Mushi et al., 2010).

Perceived quality of care was generally high among the participants compared to a study from Kenya where almost a third of women complained about incomplete and inadequate services (van Eijk et al., 2006). Considering that ANC services were of similarly low quality in the study area (Gross et al., 2011b), women's high appraisal of the quality of ANC services rather reflects their low expectations of health care services. The fact that the interviewees were recruited at the health facility and interviewed in the proximity of the health facilities also potentially affected women's answers. Among those who were not satisfied with the services provided, perceived poor quality was, however, a strong predictor for late ANC attendance (Table 7). The findings indicate that quality of care, including patient-provider-relationship, plays a critical role in determining a woman's utilization of health care services, and need to be improved but also better understood. In particular patient-provider-relationships should be further investigated through observational in-depth studies.

Late recognition of pregnancy was found to be a strong predictor of delayed ANC attendance in this study (Table 7). Similarly, late recognition of pregnancy and subsequent delay of ANC attendance has also been reported among South African women who received long acting hormonal contraceptives in the form of injections (Jewkes et al., 1998a). Although pregnancy tests seem to be available at drug shops in the study area at a price of between 500-1000 TSh (~0.30-0.60 USD) they are not widely used (personal communication: I. Mayumana). More than a quarter of participating women said they waited for the quickening before initiating ANC attendance. However, due to the limitation of quantitative methods to investigate topics that need more in-depth inquiry and trust for people to discuss them openly, this study was not able to explain whether women only waited to ensure pregnancy or also due to other reasons. Studies from Tanzania and other sub-Saharan countries have shown that late disclosure of the pregnancy due to local practices or beliefs such as witchcraft is common and has a negative influence on the timing of ANC attendance (Chapman, 2003, Haws et al., 2010, Launiala and Honkasalo, 2007, Mushi et al., 2010).

The study provides evidence for the negative influence of lacking social and financial support on women's timing of their first ANC visit and the key role of the husband or partner. The results legitimize the attempts of the Tanzanian Ministry of Health and Social Welfare to encourage greater male involvement in maternal health issues (MoH, 2000, MoH, 2003, MoHSW, 2008b) in the sense that they are better informed about maternal health risks and live up to the expectations of support towards their children and their mothers. It is important, however, that this effort does not stop at policy level but reaches down to the health facility

and community level. The community-based intervention conducted in Southern Tanzania found that in particular the equal inclusion of male community volunteers to promote obstetric care and early and frequent ANC use during home visits was an effective strategy to involve and inform men (Mushi et al., 2010). Supporting income generating activities for women such as revolving funds might be a suitable mean to reduce delay due to lack of economic means needed for ANC or other maternal health services particularly among women who lack support from their husband or partner.

Third, exploratory analysis comparing adolescent and adult pregnant women in terms of social and economic support during pregnancy confirmed that adolescent pregnant women were less likely to be married than adult pregnant women. These findings are in line with a study from Uganda reporting that adolescent first time mothers were more disadvantaged in terms of their likelihood to be rejected by partners (Atuyambe et al., 2008). On the other hand, in line with a study from Kenya (van Eijk et al., 2006), adolescents in this study were more likely to receive advice to attend the ANC clinic than adult women. However, this advice was mostly given by their mother than by their husband, partner or the child's father. These findings suggest that close family members rather than the husbands, partners and child fathers play an important role in supporting adolescent pregnant women. The fact that lacking support from the husband or partner showed no significant effect in the sensitivity analysis that included young women who visited the ANC clinic for the first time (data not shown) further supports this argument. While this support seems to be sufficient for adolescents to initiate ANC around the same time as adult pregnant women, the consequences of disadvantages in terms of social and economic support on the overall ANC attendance and – even more importantly – for delivering with skilled attendance and postnatal care for themselves and their child needs to be further investigated.

6.6.   Conclusions

The majority of pregnant women delayed ANC attendance starting at an average of five months gestation. Adolescents had no greater delay in ANC initiation than adult pregnant women despite being more likely to be single. However, first ANC attendance at four months is recommended, so it is likely that some women missed important services offered during ANC such as preventive health measures, risk screening and health education.

This study found that many women rather attended due to norms and rituals than awareness about the health benefit of prenatal care; and that they delayed ANC initiation due to late

perception of pregnancy, perceived bad quality of care and lack of social and economic support. These findings call for combined interventions at the community and health system level. Promotion of early and frequent ANC utilization through community-based interventions – involving also male community volunteers – could potentially be scaled up at low cost and adapted to local needs. Supporting income generating activities for women such as revolving funds might complement the approach in order to reduce delay due to lack of economic means needed for ANC or other maternal health services. At the same time, the quality of antenatal care services needs to be improved to attract women to use medical care throughout pregnancy, birth and the postpartum period; outreach services should be offered on a regular basis in order to bring services closer to women living in very distant settlements; and informal rules created by health workers in order to force women to attend the ANC clinic should be replaced with informing women about the benefits of maternal health services, but also the use of pregnancy tests.

6.7. Authors' contributions

KG was responsible for the design and implementation of the study, carried out the data collection, the data management and analysis, and wrote the manuscript. SA assisted with data management, statistical analysis and contributed to the interpretation of the results and the discussion of the manuscript. TRG supported statistical analysis and commented on the manuscript. JS and BO supported the design and coordination of the study and contributed to the discussion of the manuscript. All authors have read and approved the final manuscript.

6.8. Competing interests

The authors declare that they have no competing interests.

6.9. Acknowledgements

7. 'My wife, you are supposed to have a rest now': an analysis of norms and values influencing men's support during pregnancy in south-eastern Tanzania

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7.1. Abstract

Men as sexual partners, fathers and household heads have a direct bearing on women's reproductive health. However, little is known about the influence of changing norms and values on men's role during pregnancy and childbirth. This study from rural south-eastern Tanzania explores narrative accounts of men and women on men's roles and responsibilities in prenatal care and links them to an analysis of norms and values at the household level and beyond. Eight focus group discussions were conducted with men and women of different age groups. The data was consensually coded by the two first authors and analyzed using a qualitative content analysis. Four dimensions of norms and values emerged from analysis that according to the participants bear upon men's support towards pregnant women: changing gender identities; changing family and marriage structures; biomedical values disseminated in health education; and government regulations. The findings suggest that Tanzanian men are exposed to a contradictory and changing landscape of norms and values in relation to maternal health.

7.2. Introduction

After a long time of neglect, men's influence on women's and children's health has received much attention in research, development programs and health policies in recent years. Research has shown that men as sexual partners, fathers and factual or perceived decision-makers and 'bread-winners' of the households have direct bearing on women's fertility and reproductive health, on women and children's access to health services, but also on their abuse or neglect (see for example Bankole, 1995, Silberschmidt and Rasch, 2001, Greene, 2000, Greene and Biddlecom, 2000, Thaddeus and Maine, 1994). In the context of international efforts to control women's fertility and the HIV-pandemic attention focused in particular on men's involvement in the field of HIV/STDs and family planning (Dudgeon and Inhorn, 2004, Green et al., 1995, Sternberg and Hubley, 2004). Yet as Dudgeon and Inhorn (2004) pointed out in their extensive review of men's involvement in women's reproductive health in the field of medical anthropology and public health, men's participation in and influence on pregnancy and childbirth is still poorly understood.

Most of the existing studies explored men's roles in and attitudes towards prenatal care in clinical settings (see for example Carter, 2002, Muia et al., 2000, Mullany, 2006). Confuting negative stereotypes of men as "absent and problematic" when it comes to care for their pregnant women and their family (Greene and Biddlecom, 2000, Greene, 2000), studies from Kenya (Muia et al., 2000), Tanzania (Theuring et al., 2009), Nepal (Mullany, 2006), Guatemala (Carter, 2002) and Salvador (Carter and Speizer, 2005) provided evidence for men's concern for their partners' health and for their positive attitudes towards participation in antenatal care (ANC) and sexual and reproductive health (SRH) services. The authors pointed out that structural, institutional and organizational obstacles such as low knowledge levels, time constraints, societal norms and hospital policies rather than intrinsic refusal discourage men's participation (Carter, 2002, Carter and Speizer, 2005, Muia et al., 2000, Mullany, 2006, Theuring et al., 2009).

Reproductive behaviours are clearly regulated by norms, values and power relations. In Tanzania as elsewhere in sub-Saharan Africa, marriage and family structures produce and reproduce rigid gender models and ideologies entailing both rights and obligations for men and women and sustaining distinct divisions of labor and power relations. In the context of labour-migration in the mid-1950 men were increasingly assigned the role of main bread-winners and household authorities, while women were responsible for the reproductive activities at home (Tripp, 1989, Tripp, 1992, Silberschmidt, 2001, Lugalla, 1995). Studies

particularly from urban areas in Tanzania provided evidence that the economic crisis that hit Tanzania hard in the 1980s and 1990s and economic reform programs forced women into productive labour as men struggled to generate sufficient income to feed their families (Lugalla, 1995, Tripp, 1992, Silberschmidt, 2001). While stressing women's increased burden of work, it was debated whether women's economic income also resulted in greater autonomy, decision-making power and independence from their husbands (Creighton and Omari, 1995, Tripp, 1989, Tripp, 1992, Campbell et al., 1995, Koda, 1995). Although women's newly acquired roles certainly created tensions and inequity within many families and households, findings from a study on women's health practices in Dar es Salaam showed that women still stressed the importance of the support from the husbands, not only in financial but also in practical and moral dimensions (Obrist, 2006).

What this literature clearly shows is that global processes such as urbanization, modernization and socio-economic change resulted in changing gender roles and the transformation or even breakdown of social institutions in Tanzania (Campbell et al., 1995, Silberschmidt, 2001, Tripp, 1989, Tripp, 1992, Dilger, 1999). Moreover, it can be assumed that gender relations are influenced by norms and values emerging from the legal system, from the mass media and 'modern' lifestyles or the biomedical health system that are gaining importance in daily life in Tanzania.

Although all these trends have direct implications for men's roles, identities and sexual and reproductive practices, men's involvement in and attitudes towards prenatal care have not been investigated under this perspective. Thus, little is known about the influence of changing norms and values on men's roles during pregnancy and childbirth. In order to fill this gap this paper investigates men and women's narrative accounts on men's roles and responsibilities in prenatal care and links them to a literature-based analysis of changing norms and values at the household level and beyond.

7.3. Methodology

7.3.1. Research design and methods

This paper presents data from eight focus group discussions that were conducted in April 2009 within the frame of a larger research project investigating women's access to antenatal care and malaria prophylaxis in rural south-eastern Tanzania. Focus group discussions were chosen as main methodology as they are particularly suitable to uncover social norms and their ambiguity (Bloor et al., 2001). A qualitative interview guide was used during the

discussions that had been developed on the basis of insights from the literature and from exploratory studies on pregnancy and childbirth conducted in 2007 and 2008 by the first two authors. Participants were invited to describe men's responsibilities towards pregnant women; factors underlying men's neglect of these responsibilities; differences in men's support of married versus unmarried pregnant women, including adolescents; differences in men's support compared to the past; and men's involvement at ANC clinics. All group discussions were conducted in Swahili. They were tape-recorded with the informed consent of the participants and lasted on average 90 minutes.

The focus group discussions were held in two villages of the Kilombero district, Mchombe and Mkangawalo, for their distinctive characteristics (see below). In each village group discussions were conducted in separate age (under/over 35 years) and gender groups. They were carried out by a male and a female research team including the two first authors and three local research assistants trained in qualitative data collection. Each group consisted of 8 to 14 married and unmarried participants, involving a total of 85 participants. The participants had been selected with the help of the village leaders. Although the researchers had defined an age limit of 35 years to divide the two age groups, the groups finally included older and younger participants than foreseen. Participants whose age differed much from the rest of the group were indicated in Table 9 summarizing the demographic characteristics of the participants.

Table 9: Characteristics of the focus group participants

Groups	Gender (m/f)	Age range*		Village	Nr. of participants	Married out of total
FGD1	m	27-33	(40)	Mkangawalo	9	9
FGD2	m	37-60		Mkangawalo	13	13
FGD3	m	21-36	(47,53)	Mchombe	8	6
FGD4	m	36-71	(33)	Mchombe	12	12
FGD5	f	23-36		Mkangawalo	10	4
FGD6	f	38-60	(30)	Mkangawalo	11	9
FGD7	f	19-27		Mchombe	8	5
FGD8	f	39-44		Mchombe	14	9

Note: *Brackets indicate the age of single participants who substantially differed in their age from the rest of the group.

7.3.2. Data management and analysis

The recorded group discussions were transcribed by the research assistants but not translated into English. As IM is a native Tanzanian and KG fluent in Swahili it was possible to work on the original Swahili text. Citations used in the text and difficult text segments where the European first author encountered problems were translated by the Tanzanian first author into English and were jointly discussed.

The transcripts were managed and coded using MAXqda2 software (VERBI Software, Marburg, Germany). Data were analyzed according to Mayring's (2007) qualitative content analysis and involved 'consensual coding' (Schmidt, 2005): guided by the research questions each of the two main authors coded the text segments inductively into categories and sub-categories. Codes and their allocation were then compared and discussed. A joint code catalogue was developed that guided the subsequent individual data analysis of all group discussion data. The congruency of assigned codes and findings was continually compared and discussed alongside the data analysis process. Finally, findings from the data analysis were compared within and between gender and age groups used for the group discussions.

7.3.3. Local setting

The area constitutes of a fertile rural landscape that is regularly flooded by the Kilombero River during the rainy season from December to April. Rice together with maize and cassava build people's main staple food (Hetzel et al., 2007, Schellenberg et al., 1999). Agricultural work is done both by men and women and often requires household members to move to temporary shelters for several months during the rice planting and harvesting season, since field sites are located far from home (Hetzel et al., 2008). Men obtain additional income from casual labour or fishing, while women sell local brewery or farm products (Hausmann Muela, 2000). Commercial and trading activities have increased in the area since the construction of the Tanzania Zambia Railway (TAZARA) by the Chinese between 1970 and 1975 that connected parts of the Kilombero district with Mbeya and Dar es Salaam but also due to improved road conditions (Hausmann Muela, 2000). However, despite these opportunities the majority of people still live in extreme poverty.

In 2008, the two selected villages had a population of 6215 (Mkangawalo) and 4758 (Mchombe) and were quiet distinct regarding their accessibility, business activities and ethnic homogeneity/heterogeneity: Having no TAZARA train stop, Mkangawalo is only reachable through a mud road that is often hardly passable, especially during the rain season. Most habitants belong to the ethnic group of the WaNdamba and live from subsistence farming. In

comparison, Mchombe has a railway stop and builds a lively commercial centre. It is marked by ethnic heterogeneity and diverse livelihood activities.

7.4. Findings

Drawing on the data from the group discussions, this section identifies norms and values at different societal levels that men and women perceived to bear upon men's support towards pregnant women. Four main dimensions of influence have been derived from data analysis: changing gender roles; changing family and marriage structures; biomedical values through health education; and government regulations.

7.4.1. Changing gender roles

Ideas about the gendered division of responsibilities permeate the realm of pregnancy and childbirth. In the group discussions, both men and women expressed expectations regarding men's involvement during pregnancy that reflected a shared set of norms and values and were strongly linked to gender roles. Men presented themselves as the household heads and 'breadwinners'. The primary responsibility associated with this status was to provide financial security for their family and controlling the household's financial and agricultural resources:

> A man... because he is the head of the house... in fact he is responsible to find money.
> (Male, FGD3)

> On the side of money the power lays with a man. In our lives here, there are no businesses at all that could provide women with income. She depends to a big part on the man. (Male, FGD1)

In the context of prenatal care, the provision of financial means needed for the preparation of and during childbirth was mentioned as men's main responsibility. Although pregnant women in Tanzania are officially exempted from all costs (MoHSW, 2008b), antenatal care and delivery implies a variety of expenses. As in other regions of Tanzania these expenses include direct and indirect costs incurred at the ANC clinics for diagnostic tests and drugs, for the preparation of supplies needed during the delivery such as gloves, plastic sheets and cloths, for the delivery itself, and for the transport and hospital stay (Kowalewski et al., 2002, Kruk et al., 2008, von Both et al., 2008). In the group discussions, women first reproduced local gender models by expressing their expectations towards men as providers of financial means. However, lamenting at a later stage that men were often unwilling or unable to cover the costs occurring during pregnancy and childbirth, they provided evidence that gender models rarely accurately reflect male-female relationships as they are enacted in daily life (Ortner and Whitehead, 1981).

> Even when you tell your husband that in the clinic they told us to have clothes with us [at the delivery], for example five pairs of vitenge [cloth] or five pairs of khanga [another kind of cloth], or to have an umbrella for the child or to have a nappy or any other thing, for example gloves, some men refuse. They say, `I can not provide all these things'. (Female, FGD6)

Both male and female participants identified poverty and economic hardship as major barriers for men's support during pregnancy and delivery. In contrast to the past, men were perceived and perceived themselves as increasingly incapable to fulfil expectations towards their social roles as providers of financial means. In a male group discussion, a young man put it the following way:

> Men are escaping [responsibilities] these days because life is tough for a person to bear another burden. (Male, FGD1)

The steady decline of men's assured status as breadwinner and provider of the family that economic decline, unemployment and lack of income earning opportunities triggered in Tanzania has been described extensively for the urban context of Dar es Salaam (Silberschmidt, 2001, Silberschmidt, 2005, Tripp, 1989, Tripp, 1992). Statements like the one of this man, however, suggest that these macro-economic trends also resulted in a 'crisis of masculinity' in rural areas. Moreover, the discussions illustrated not only the 'demasculinizing' effect of poverty (Cleaver, 2002:3) and economic change but also women's incorporation into the informal sector and self-dependency in this rural setting. Similar to Silberschmidt's (2001), Tripp's (1989) and Obrist's (2006) descriptions from urban Dar es Salaam of women's increasing awareness that they can stand on their own, female participants from Mchombe presented themselves not only as successful entrepreneurs who are able to earn their own money by running small businesses but also as mothers who do not depend on men's support to raise their children.

> In the past, a woman was not able to depend on her own, because it was very difficult [for a woman] to get hold of money. Men were the ones who went to the river to fish. They brought the fish by foot, and went to Kilosa to sell it. You see it is a tough work; that was how life was. But today, I can take my money and the bike I go to the river. I get fish, come back and sell it here. (Female, FGD8)

> Myself, I have my money I don't ask my husband, not one day. [...] I am planning the household budget with my own money. He has his work. Even regarding the children, I say, I have them all from one man, isn't it that they are all mine? (Female, FGD8)

Expressing delight about the increased possibilities to be financially independent by growing and selling rice or running a small business, these women kept silent about the burden of

increased responsibility, vulnerability and conflicts with their partners that may go along with their empowerment and economic independency. By raising their children without the personal and financial support from the child father, they demanded the custody of their children that according to patrilineal custom belong to the father's family through the transfer of bride wealth (Lovett, 1996). Literature, but also the authors own observations, show however that unmarried as well as separated mothers may lack ties with the child father's relatives or even with their own family reflecting the "shame" attached to out-of-wedlock birth and/or marriage failure, and therefore lack access to resources (Chant, 2007).

Gender ideologies also go along with a clear division of productive tasks between women and men. According to local gender models domestic tasks such as cooking, cleaning, washing clothes and fetching water belong to women's duties. Men living together with a woman are not expected to perform household tasks. However, both male and female participants agreed that during pregnancy men are supposed to help their pregnant women with heavy work on the farming fields and in the household such as cutting and carrying fire woods, fetching water and washing clothes, in particular during the later stages of pregnancy. These statements suggested that crossing traditional gender boundaries may be socially acceptable during this period and men's involvement is interpreted as being a good partner and father (see also Carter, 2002). At the same time, both men and women gave examples of societal disdain discouraging or ridiculing men's attempts to help women with household activities. Similar to what Mullany (2006) reports from the Nepali context and Muia (2000) from Kenya, participants mentioned phrases and idioms in Swahili that have been coined for husbands who are viewed as too supportive or involved with their wives.

> If you are helping your wife a lot, others pass by saying, 'ah, Mister X has become a '*mume bwege*' [a foolish husband] these days, he takes care of everything'. This might influence men's fear to be called a '*mume bwege'*. (Male, FGD4)

> If young men are sitting here at the cross-road, they might pass and see that a man is doing household work, maybe to fetch water at the dwell. Once he passes that group they say, 'Ah, these days our friend has become *bushoke* [be witched by their wife in order to make him amendable]'. Yes, that is how it is. (Female, FGD7)

7.4.2. Changing family and marriage structures

Men and especially women associated lack of male support during pregnancy strongly with pregnancies out-of-wedlock, a phenomenon that according to them has increased compared to the past. Influenced by the researchers' interest in inquiring the groups of women who least benefited from men's support the participants' discussion focused in particular on men's

support towards two categories of pregnant women: women in extra-marital relationships that were often referred to as 'small house' or 'second house' [*nyumba ndogo* or *nyumba ya pili*] by the participants and unmarried girls.

Although both male and female participants agreed that pregnant women who were married or for whom marriage plans existed were much better placed to receive support from their partners compared to uncommitted pregnant women, they disagreed about the reasons. While women made reference to the priority of claims of married women, men rather stressed poverty and the secrecy surrounding these relationships as obstacles to support women in the 'small house' or 'second house'.

> The costs of living seem to have increased and life is very difficult. To support a woman besides your wife is not easy. People focus on their own goals. If a man plans with his wife to do this and this, then it is not easy to decide to redirect his resources to a lover. (Male, FGD1)

> It is different for the women who live in the 'second house', because I live together with my wife. In case she does not feel well she will tell me anytime and we can decide whether we should go to the health facility or not. But the situation is different for women staying away from the man: in case there is a problem the man will not be around. (Male, FGD4)

A major concern of all participants of the group discussions constituted pregnancies among young girls. This is not surprising as adolescent sexual activity and the increasing number of teenage pregnancies has become a widely debated moral and health problem in Tanzania and other Sub-Saharan countries (Obrist van Eeuwijk and Mlangwa, 1997, Silberschmidt and Rasch, 2001, Tumbo-Masabo and Liljeström, 1994). As in other parts of Tanzania, men and women associated these trends with the decay of traditions and social norms surrounding family and marriage and with changing family structures (Dilger, 2003, Setel, 1999). In particular elderly participants interpreted the increased number of pregnancies out of wedlock among young girls as a result of eroding parental authority and lineage control over children's sexuality and the breakdown of traditions such as initiation rites. Young people were described as having lost their respect and morality, and instead to follow new lifestyles, thereby contrasting youth's behaviour with the social construction of an idealized past (see also Dilger, 1999).

> In the past, not many women became pregnant out of wedlock. First, they were living in clans. Even a man who would decide to approach a woman would have been disciplined [...].These days a man can have up to ten women, therefore there is a big difference. In the past traditions and norms were considered a lot. (Male, FGD2)

Men were criticized by elderly participants to cause young women's pregnancy and then running off or denying fatherhood. However, criticism was rather related to young men's financial inability or unwillingness to take care of the girls they impregnated than to their sexual activity. This reflects existing norms and values which give positive connotation to men's economic power and sexual activities. Several studies reveal that extra-marital and casual sexual encounters are perceived as a legitimate way for men to enhance self-esteem and masculinity (Silberschmidt, 2001, Wight et al., 2006, Fuglesang, 1997). Dilger (2003) and Wight et al. (2006) show that in particular young men use sexuality and the fathering of a child to prove their masculinity in the context of peer pressure but rarely feel responsible for their pregnant girlfriend or for the common child. The group discussion but also the researcher's own exploratory studies revealed that in this case the girl's parents are expected to bear the financial burden related to pregnancy and childbirth.

At the same time participants accused young girls for their material avidity. Elderly participants blamed girls' desire for make-up, hair styling and nice dresses in the context of peer pressure and poverty to be responsible for the increased number of pregnancies among young unmarried girls. Dilger (2003) and Wight et al. (2006) reported similar moral discourses of commoditization and modernity blaming young girls from Northern Tanzania. The school, and in particular sexual education in school, was perceived as another factor changing girls' attitudes and entailing their precipitated sexual debuts during school time (Wight et al., 2006).

> When a girl goes to school she sees her friends putting oil in their hair etc. At home, she does not even have soap. If she is deceived by a man, she will agree, she knows, maybe she will get soap. But what a surprise, she will get pregnant and be left alone. (Female, FGD8)

> In the past, girls cared for themselves and put themselves in proper conditions [...]. Now you see young girls who have not even reached 14 years, who are 12 years old, already having sex with old men of 70 years. You see, now it is the character that puts down the status of girls. This means, often they are given education on this [sexuality] that they do not yet understand and the result is often pregnancy. (Male, FGD2)

Several scholars show that in the past strict norms regulated women's sexual respectability and women were expected to remain virgins until marriage (Wight et al., 2006, Dilger, 2003, Lovett, 1996, Silberschmidt, 2001). Although these norms are reported to be less restrictive today (Wight et al., 2006), participants still believed that women's sexual reputation influences men's support and care during pregnancy and delivery. If a woman is associated with relationships to more than one man, participants perceived men to be likely – and

legitimate – to refuse the responsibility to care for the pregnant woman and her child since they could not be sure whether they were really the father of the child.

> If a girl mingles around – today she is dating Bakari, tomorrow Hussein – no one will accept the responsibility for the pregnancy. This is the reason for unmarried women to lack proper care and support. (Male, FDG1)

Participants associated the increased number of pregnancies out-of-wedlock also with the transformation of marriage as an institution. According to them, in the past, marriage required arrangements and bride price negotiations between the elders of the two families. The transfer of the bride-wealth by the prospective husband's family not only compensated the bride's family for the loss of her productive and reproductive services and gave the husbands' lineage claim to the children born by the wife, but also established a contractual bond between the two lineages. Moreover, marriage as a social institution contributed to the maintenance of social control.

> Once you started to menstruate, you were put inside until your spouse was found and you got married. This spouse, whether you saw him before, whether you loved him or not, you had to marry him. Be it that he had money or that he had a difficult life, be it that he had no house nor hut, you had to go there. (Female, FGD7)

> In the past a boy did not go to desire a girl except if he was chosen. 'If you, my son, want to get married to Mwambike's daughter, I go there as your father, not you'. Therefore, the father goes over to talk to the father of the girl. If the plans are accomplished, the father goes over and delivers [the bride price]. When he finished to deliver the bride price, the girl was handed over. But these days, it is completely different. Even if you make a little sound to attract a woman's attention [*ukipiga uluzi*], she stops and says 'what's up, brother?' (Male, FGD4)

Participants highlighted the shift from large multi-generational families to nuclear families, and the decreased power of the extended family in arranging marriages. They argued that while in the past a married couple could rely on help from a wide net of family friends and relatives, parental responsibilities now rest with fewer people and couples are forced to depend on their own resources. On the one hand this declining support from the extended family was reported to improve men's support towards their women, on the other hand to cause pregnant women being easily abandoned by the child's father as well as by their parents.

> Now it seems that men are involved very much in caring for their wives when they are pregnant, that is different to the past. In the past, services like these [of the men] did not exist. When the woman was pregnant I could tell either my mother or my father who were responsible for the negotiations with the woman's parents and all the preparations up to

the delivery [could be done] because they were very close with her. Therefore my own contributions were very small. (Male, FGD4)

In the past, parents were able to take the girl and to help you to support her. Parents were even able to take her home and to care for her, but it is very difficult these days. (Male, FGD3)

The researchers' own observations showed however that in particular young pregnant girls could still rely on the social and financial support of their parents or the wider family although they caused a heavy burden for their family.

7.4.3. Biomedical values and health education

Discussions with men and women on male involvement as a mean to improve maternal health reflected the internalization of an "authorative biomedical knowledge" on a narrative level. Similar to other institutions, medicine exercises a moral authority over individuals. Biomedical knowledge can be understood as an "authorative knowledge" in the sense of Brigitte Jordan (1993[1987]) because an increasing number of people gradually internalize it, accept its legitimacy, and actively and unselfconsciously produce, reproduce and demand it in their own everyday practices.

Congruently with the recent emphasis of the Ministry of Health on men's involvement in maternal health (MoH, 2000, MoH, 2003) men reproduced expectations about their responsibilities to accompany pregnant women to the ANC services, to support them at home and during delivery and to get tested for HIV.

There are changes. In the past for instance when I went to the farming field with my pregnant wife she was the one to carry the luggage and on the way back she was carrying the hoe, fire wood and a child. Now things have changed. Now I am the one to go to the farming field while my wife stays at home. If my wife gets pregnant I tell her 'My wife, now you're supposed to have a rest'. This is because of the education that has been provided: 'Dear husbands, the pregnant woman is supposed to be cared well until her delivery'. (Male, FGD4)

This statement nicely reflects the internalization of health education messages among men. Moreover, the quote of a young man who called HIV testing to be an order [*amri*] stresses the normative and authorative forces that the biomedical system imposes on people similar to societal institutions such as family and kinship.

If you have not yet both been tested, there is an order [amri] that is implemented. Not only the woman is requested [to get tested], even the man who caused her pregnancy. (Male, FGD3)

Whether men are willing to put public health expectations into practice is to a large extent shaped by their knowledge, morality and pragmatics, but depends as well on the health system itself. Men generally showed great willingness to acquire reproductive health knowledge and be more involved in antenatal care. At the same time, many expressed their frustration of being excluded from the ANC services (see also Mullany, 2006).

> In fact the reproductive health education is still at a low level for men. We are not well involved because when we go to the clinic we end up testing for HIV/AIDS and stay out...I think we also need health education that is usually given to pregnant women when they come to the ANC clinic. (Male, FGD1)

> They should be sensitized, I mean, they should be educated. Some of them have never been to school, so even if they are told by their wives 'I have been told this and that' they might not listen compared to a man who has a better understanding of it. (Female, FDG5)

As this second statement shows, not only men but also women were positive about involving men in reproductive health education as they expected it to result in an improved health communication between men and women.

7.4.4. Legal guidelines

The group discussions revealed that not only social norms and values but also state laws and regulations influence men's support during pregnancy. While family life in the study area has been regulated by kinship and segmentary lineage systems of ethnic communities, it has increasingly become a subject of governmental interference through laws, education and the health system, weakening its control. State laws include for example the Penal Code that has been amended by the Sexual Offences Special Provision Act in 1998 declaring abortion but also rape, abduction of girls under eighteen and other related acts as crimes; the Law and Marriage Act from 1971 grants women legal equality with men and increased the legal age of marriage to 18 years; the Affiliation Ordinance deals with rules of paternity for children born out of wedlock and that makes provision for the maintenance of the child by the fathers (Rwebangira, 1994).

This research showed that gender roles and family issues in the villages are still coined by the patriarchical system characteristic for many ethnic groups. However, single statements such as the following blunt overstatement of a male participant provide evidence for men's awareness and critical evaluation of the increasing acknowledgment of women's rights by political authorities compared to the past.

> As I understand it, there are big changes. In the past a pregnant woman did all work, she cut wood, did all work at the household. The man was pursuing his own businesses. If he

went to the beer clubs for drinks, he came back home at night, and made a lot of chaos without caring whether his wife was tired. He woke her up to provide him with some food because she had to follow his orders. She waited until he would have finished, removed the dishes, and then she went back to bed. Now these manners do not exist anymore because if you treat the girls brutally today, you will very soon find yourself seeing the village leader, at the council. If you are found to have done even a small mistake you will sit in. (Male, FGD3)

Although the Tanzanian law prohibits sexual intercourse with girls under 18 years of age declaring it as rape in order to protect women's health it might actually have counterproductive consequences for young women who have fallen pregnant. Participants of the group discussions agreed uniformly that particularly school-girls' chances to be supported by the child father and his family is very small as the men risk to be jailed for over 10 years. Men who impregnated a teenage student were therefore expected to escape out of fear to be caught.

If you cause pregnancy to a student you will better be found dead than alive, the problems that you will experience you will regret. If you will be caught you will be in trouble. If possible you need to disappear and go to a region that people of this village do not go to, then you will be safe. So, it is very dangerous to cause pregnancy to a secondary or primary school girl. (Male, FDG1)

7.5. Conclusions

Understanding the context-specific barriers of male involvement in maternal health is a crucial step towards appropriate and applicable interventions. So far studies have mainly concentrated on the clinical setting (see for example Carter, 2002, Muia et al., 2000, Mullany, 2006, Theuring et al., 2009), while barriers at the community level are still little understood.

This exploratory study aims at contributing to fill this gap by investigating men and women's narrative accounts on men's roles and responsibilities in prenatal care and linking them to an analysis of norms and values at different societal levels.

The findings show that Tanzanian men are exposed to the contradictory and changing landscape of norms and expectations in relation to maternal health. As in other regions, social norms and values anchored in customary concepts of gender roles and family structures are still of importance for family life in Tanzania (Silberschmidt, 2001, Wight et al., 2006, Lovett, 1996); men are still depicted and presented themselves as heads and providers of the household. In fact, several customary norms enhance men's support for their wives during pregnancy. In particular, marriage provides women with demandable rights towards

their husbands' or even his extended kin's support. At the same time these values have been rendered ambiguous through structural processes such as modernity, migration and economic decline (Dilger, 2003, Wight et al., 2006). The 'demasculinizing' effect of poverty (Cleaver, 2002:3), women's intrusion in the informal economic sector and the high number of informal unions have resulted in changed gender and power relations articulated in moral discourses (Dilger, 2003, Tripp, 1989). These dimensions provide on the one hand possibilities for men to dodge responsibilities; on the other hand, from the men's point of view, they constitute real obstacles to satisfy 'modern' expectations towards them as caring partners and fathers. Men and women's narratives reflected the increasing influence of values and expectations from the biomedical and juridical system disseminated through mass media, education and health education propagating gender equality and women's rights.

Several recent studies stressed men's concern for their female partner's health and reported positive attitudes towards participation in ANC and SRH services among them (Carter, 2002, Carter and Speizer, 2005, Muia et al., 2000, Mullany, 2006, Theuring et al., 2009). Similarly, Montgomery et al. (2006) showed in a study on the effect of the HIV epidemic on men's involvement in family life in South Africa that men were proactively involved in a range of diverse activities within immediate and extended families in order to cope with the numerous impacts of HIV/AIDS. Yet, they noted that prevailing norms regarding gender roles and responsibilities within households worked against the community acknowledgment of such an involvement. Instead attention kept focusing on men's frequent inability to meet the traditional obligations of economic provision constructing an image of men as absent, irresponsible and untrustworthy (Montgomery et al., 2006).

This study provides evidence for the existence of both enhancing and constraining norms and values concerning men's involvement in maternal health. However, contrary to the study of Montgomery et al. (2006) this study could not rely on observations of men's reproductive practices in relation to pregnancy. It is well known that practices do not follow fixed gender models but are the product of moral stances and negotiations in day-to-day life (Ortner and Whitehead, 1981). Thus the study reflects men's and women's representations of norms, values and expectations related to men's roles during pregnancy. Taking the observation of Montgomery et al. (2006) into account, it might be possible that participants were downplaying men's involvement. On the other hand, it is very likely that participants' responses were influenced by associating the research team with an international health institute and by the presence of the first author, a young white European woman who was

pregnant herself during the time of data collection. Against this background it is not surprising that men presented themselves as highly motivated to become more involved in maternal health and as caring partners and fathers. As this paper leaves many questions unanswered regarding practice in real-live observational studies are urgently needed in order to get a clearer picture of men's reproductive practices in the context of changing societal norms and values.

7.6.   Acknowledgement

8. ANC in practice: an explorative study in antenatal care clinics in the Kilombero Valley, south-eastern Tanzania

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8.1.   Abstract

8.1.1. Background

The potential of antenatal care for reducing maternal morbidity and improving newborn survival and health is widely acknowledged. Yet there are worrying gaps in knowledge of the quality of antenatal care provided in Tanzania. In particular, determinants of health workers' performance have not yet been fully understood. This paper uses ethnographic methods to document health workers' antenatal care practices with reference to the national Focused Antenatal Care guidelines and identifies factors influencing health workers' performance. Potential implications for improving antenatal care provision in Tanzania are discussed.

8.1.2. Methods

Combining different qualitative techniques, we studied health workers' antenatal care practices in four public antenatal care clinics in the Kilombero Valley, south-eastern Tanzania. A total of 36 antenatal care consultations were observed and compared with the Focused Antenatal Care guidelines. Participant observation, informal discussions and in-depth interviews with the staff helped to identify and explain health workers' practices and contextual factors influencing antenatal care provision.

8.1.3. Results

The delivery of antenatal care services to pregnant women at the selected antenatal care clinics varied widely. Some services that are recommended by the Focused Antenatal Care guidelines were given to all women while other services were not delivered at all. Factors influencing health workers' practices were poor implementation of the Focused Antenatal Care guidelines, lack of trained staff and absenteeism, supply shortages and use of working tools that are not consistent with the Focused Antenatal Care guidelines. Health workers react to difficult working conditions by developing informal practices as coping strategies or "street-level bureaucracy".

8.1.4. Conclusions

Efforts to improve antenatal care should address shortages of trained staff through expanding training opportunities, including health worker cadres with little pre-service training. Attention should be paid to the identification of informal practices resulting from individual coping strategies and "street-level bureaucracy" in order to tackle problems before they become part of the organizational culture.

8.2. Background

There is little evidence that antenatal care (ANC) prevents maternal mortality (Bergsjo, 2001, Jaddoe, 2009, McDonagh, 1996). However, the potential of antenatal care for reducing maternal morbidity and improving newborn survival and health has been widely acknowledged (Abou-Zahr and Wardlaw, 2003). The antenatal period provides excellent opportunities to reach pregnant women with prophylactic medication, vaccinations, diagnosis and treatment of infectious diseases, as well as with health education programs (Campbell and Graham, 2006). Proven effective antenatal interventions include serologic screening for syphilis, provision of malaria prevention, anti-tetanus immunization and prevention of mother-to-child-transmission of HIV (Bergsjo and Villar, 1997, Villar and Bergsjo, 1997). Provision of advice during antenatal care about potential pregnancy complications and danger signs, and information on how to seek medical care, are viewed as key strategies to reduce delay in seeking skilled care (Bergsjo, 2001, Nikiema et al., 2009). Moreover, a positive association between the level of care obtained during ANC and skilled delivery care has been reported (Bloom et al., 1999). Emphasizing the quality instead of the quantity of visits, the Focused Antenatal Care (FANC) model promoted by the WHO reflects this new understanding of the role of ANC (Villar and Bergsjo, 2002).

In Tanzania, the Ministry of Health and Social Welfare implemented the FANC policy in 2002 and used it for cascading health worker training on a central, regional and district level (MoH and JHPIEGO, 2004, Tibaijuka et al., 2007). The FANC model emphasizes goal-oriented and women-centred care by skilled providers (MoH and JHPIEGO, 2004). Activities of the new model include the early detection of danger signs and referral; therapeutic interventions known to be beneficial; and alerting pregnant women to emergencies and instructing them on appropriate responses (Villar and Bergsjo, 2002). In fact, one of the main goals of the new model is to strengthen the information component through individual health education and counselling (Langer et al., 2002, Villar and Bergsjo, 2002).

However, quality assessments of antenatal care services provided to pregnant women raised questions about health workers' performance: practice often diverges from the standards required in the guidelines (Boller et al., 2003, Ouma et al., 2010, Sarker et al., 2010, Urassa et al., 2002, von Both et al., 2006). In Tanzania, national data from 2004/05 indicated that less than half of all women received information on signs of pregnancy complications, had urine samples taken or were given a full dose of preventive anti-malaria chemotherapy (NBS

and MEASURE DHS, 2005). Other recent studies examining single antenatal care programs or routine ANC provision in Tanzania reported in particular the poor quality of technical aspects such as clinical and laboratory examinations (Boller et al., 2003, Gilson et al., 1993, Sarker et al., 2010, Urassa et al., 2002) or drug administration (Boller et al., 2003, Urassa et al., 2002). Boller et al. (2003), who assessed quality of care in public and private ANC clinics in Dar es Salaam, found that guidelines were frequently not respected and diagnostic examinations were not carried out by health workers. At 12 minutes for first visits and 6.5 minutes for return visits, consultation times were short and differed significantly from the required time anticipated according to the FANC guidelines (42 minutes and 32 minutes respectively) (von Both et al., 2006). Health problems may thus often be missed (MacLeod and Rhode, 1998). Moreover, there are reports of poor counselling and inadequate health education of pregnant women (Magoma et al., 2010, Pembe et al., 2009, Sarker et al., 2010, Urassa et al., 2002, von Both et al., 2006) or negative health worker attitudes (Mrisho et al., 2009).

Although inadequate health workers' performance has been widely described, determinants of poor performance are not fully understood (Rowe et al., 2005). In many studies national guidelines serve as a "gold standard" to assess observed health workers' performance during patient consultations (Franco et al., 2002b). However, recent qualitative studies emphasize the importance of comprehending the complex context in which guidelines are put into practice. Mathole et al. (2004) and Walker and Gilson (2004), for example, assessed the implementation of policy changes in Zimbabwe and South Africa and illustrated health workers' difficulties in handling the changes due to resource shortages and poor policy implementation.They showed that health workers developed informal practices in order to cope with the high demand for their services and the difficult working situation. Two studies from Tanzania and the UK illustrated how peer pressure, perceived patients' preferences and team support lead clinicians to take decisions based on constructed "mindlines" that are the result of day-to-day practice rather than evidence-based knowledge (Chandler et al., 2008, Gabbay and le May, 2004).

The aim of this exploratory study is to investigate the interplay between policy, context and practice and its influence on antenatal care provision in four rural ANC clinics in south-eastern Tanzania. First, it examines how health workers' ANC practices relate to the national FANC guidelines. Second, reasons for health workers' practices are explored from health

workers' points of view. Finally, the study's insights and their potential implications for antenatal care provision in Tanzania are discussed.

8.3. Methods

8.3.1. Study area

Data for this study were collected in health facilities during research visits of one week per facility in July 2008 and during short one-day follow-up visits in April 2009 in the Kilombero and Ulanga Districts, Morogoro Region in south-eastern Tanzania. The study area comprised the 25 villages of the 'Health and Demographic Surveillance System' that has been described extensively by other authors (Armstrong Schellenberg et al., 2002, Dillip et al., 2009, Hetzel et al., 2007, Schellenberg et al., 1999). The Tanzanian public health system consists of a dense network of dispensaries, health centres and hospitals. At the time of the study, two public health centres and ten dispensaries (7 public and 3 private not-for-profit) provided Reproductive-and-Child-Health (RCH) care services in the research area on a weekly or daily basis from Monday to Friday. Two district hospitals served as referral hospitals. The local health system runs a cost-sharing scheme from which pregnant women and children under five years of age are exempted.

Four public health facilities were selected in the study area: both of the health centres (HC) and one selected dispensary (D) from each district. The selection of the dispensaries was based on the criteria of 1) daily RCH service provision and 2) high numbers of pregnant women attending the RCH clinic based on patient registers.

8.3.2. Data collection

The present study used qualitative methodology including 4 elements: 1) participant observation of daily RCH clinic procedures, 2) structured observation of ANC consultations, 3) informal conversations with pregnant women and health workers and 4) in-depth interviews with the five health workers available at the RCH clinics at the time of the study. Data collection was carried out in Swahili at each health facility over a one-week period by one of the investigators (KG). She was supported by a research assistant who could help with nuances of the language. In the four health facilities, 39 ANC consultations were selected for observation by convenience sampling. ANC consultations were spread over the whole week and included consultations of women attending for the first time as well as return visits. The number of observed consultations per health worker ranged from 3 to 21, depending on the number of women attending per facility. Three women were excluded from the sample since they did not receive any services, and thus their consultations could not be observed. Two of them attended on the "wrong" day and one woman came with an early

pregnancy that could not be confirmed. The three women were sent home and told to come again another day. This led to a final sample of 36 observed ANC consultations. Structured observation was used to record services delivered during the ANC consultations. A checklist including 41 recommended services was developed on the basis of the Tanzanian FANC guidelines (MoH and JHPIEGO, 2004). Three services delivered at the laboratory facilities were later excluded because they could not be directly observed. This led to a final list of 38 recommended services on which data were collected (see Figure 10, p.99).

Because of the health workers' high work load, the participant observers became involved in administrative work and registering clients. Informal conversations with the health workers during and after work helped to understand clinic procedures and to clarify questions that had arisen during the observations. Notes were taken during the observations and conversations and were elaborated the same day in descriptive field notes (Bernard, 2000) in collaboration with the research assistant.

Towards the end of the week, in-depth interviews were conducted with the five health workers who had been present at the time of the study. The interview guidelines explored contextual factors influencing health workers' ANC practices such as health workers' training and position, their perceived work problems, work expectations and interaction with their patients, colleagues and supervisors. All in-depth interviews were tape-recorded with health workers' permission.

8.3.3. Data analysis

The in-depth interviews were transcribed and translated into English by two research assistants fluent in English and Swahili. One of us (KG) reviewed the transcripts and original recordings and discussed ambiguities with the research assistants.

For data analysis, data from the structured observation of 36 ANC consultations were compared with the FANC guidelines (MoH and JHPIEGO, 2004) and the ANC card. For each of the 38 services it was determined whether according to the FANC guidelines the women should have received the specific service considering her gestational age and/or number of ANC visits. This was then compared with the structured observations of ANC consultations. Data from the in-depth interviews, the participant observations and informal conversations were used to contextualize and validate the findings from the structured observations. Data analysis was guided by a mix of inductive and deductive category building and was completed using MAXqda2 (VERBI Software, Marburg, Germany). In the in-depth interviews, the most prevalent themes raised by the health workers were coded into categories using qualitative content analysis (Mayring, 2007) and tested in the further analysis of the

interviews. The same categories were applied to the field notes of the observations and informal conversations in order to check their validity. Additionally, analysis of all data sources was guided by the researchers' interest in how rules and regulations determine health workers' practices. In order to explore differences in service delivery between and within health facilities, information on the identified themes was cross-tabulated for comparison between and within the health facilities. Questions arising during data analysis were addressed in follow-up and feedback visits at the four health facilities in April 2009.

8.3.4. Ethical considerations
In conformity with the Helsinki Declaration, this study was discussed and approved by the district RCH coordinators and staff in -charge were asked for permission to conduct the study at their facilities. Oral or written consent was obtained from all pregnant women and health workers participating in the study after explaining the purpose of the study to them and informing them of their right to withdraw at any time.

The study received clearance from the Tanzanian National Institution for Medical Research as part of the ACCESS Programme (NIMR/HQ/R.8c/Vol. I/66). The study was also approved by the two review boards of the Swiss Tropical and Public Health Institute (STPH), formerly known as Swiss Tropical Institute (STI), and the Ifakara Health Institute (IHI), formerly known as Ifakara Health Research and Development Centre (IHRDC).

8.4.   Results

8.4.1. ANC in practice
The ANC clinics officially opened at 8am and closed at 3.30pm. Health workers encouraged pregnant women to arrive early in the morning, but service delivery usually did not start on time either due to the late arrival of the pregnant women or due to the health workers being busy with other activities, such as attending children. While ANC return visits tended to take a few minutes and only consisted of abdominal examinations, blood pressure measurements, and the administration of Sulphadoxine-Pyrimethamine (SP) and other drugs, pregnant women's first ANC visits were time-intensive. They were organized along the five thematic components of service provision stipulated by the FANC guidelines: 1) history taking, 2) physical examination, 3) laboratory examinations, 4) drug administration and immunization and 5) health education. Figure 10 provides an overview of the services delivered to pregnant women in comparison with the requirements of the national FANC guidelines and Table 10 gives a descriptive account of a typical morning at one of the ANC clinics.

Table 10: Description of a typical morning at one ANC clinic based on field notes

Activity	Routine ANC procedures
	We arrived at the health facility at 9:30 am. At the RCH clinic, around forty mothers and their children were waiting outside the examination room for the auxiliary nurse to vaccinate the children. The auxiliary nurse was attending the children alone because the nurse midwife had left the facility a month ago. She weighed and vaccinated them, filled in the cards and gave health education to the mothers. Three pregnant women who had arrived in the morning were waiting outside. It was their first visit to the ANC clinic. At 2 pm the auxiliary nurse started to attend them.
History taking	In the attendance room the auxiliary nurse started to collect personal information from the pregnant women and to ask them about their history of previous pregnancies and illnesses. She registered the information on the ANC cards and the health facility register. Using the date of the last menstruation she calculated the expected delivery date. The other two pregnant women listened quietly.
Physical examination	Although the auxiliary nurse initially wanted to postpone the height and length measurement to the women's next visit, she changed her mind and went to measure and weigh the women. Then, she invited the women to the examination room for the physical examination. One at a time, each woman went to the separate delivery room and lay down on the bed. The auxiliary nurse measured fundal height, listened to foetal heart sounds and palpated the child's position.
Drug administration/ immunization	Then, the women received Tetanus vaccines and got their blood pressure measured. Finally, the women were asked to get water from the drug dispensing room to swallow SP.
Laboratory investigations	The women were told to come back on the 24th of the same month to test for Syphilis because the test would then be conducted for all pregnant women. None of the women were tested for HIV/AIDS. The auxiliary nurse explained that she was not able to perform the test because the only person who was trained had gone for training. She told them to get tested in another health facility.
Health education	Then, the health education started. The nurse was first sitting on a chair but got up saying that she was used to standing while giving the health education. She disseminated the health messages in a didactic manner: standing in front of the women, telling them what they should do and asking questions to check the women's attention. Often the women did not respond to her questions. She emphasized the importance of starting ANC attendance early. Then she started to talk about hygiene and stressed that women should keep themselves and their clothes clean. She reminded the women to put small savings to the side in order to be prepared for the delivery and for potential emergencies requiring transport to the hospital. She explained what supplies they would need for the delivery and emphasized the importance of giving birth at the health facility and not with a traditional birth attendant (TBA). She stressed that TBAs lack supplies and experience. She explained the Tetanus schedule to the women with the help of the Tetanus card and asked them to come back to the health facility for the postpartum care.

History taking was usually conducted individually, although in one health facility women were asked these personal questions in the presence of the other women. Women's information was recorded in the health facility register and on women's ANC cards. During the physical examination, the main activity observed was the abdominal examinations, including manual palpation of the foetus, measurement of the fundal height, the fundal lie and listening to the

foetal heart rate that was performed for all women. Most of the women had their blood pressure measured; however, genital examination and check of body temperature, pulse and respiration were not conducted at any of the selected health facilities. A few cases of oedema were recognized during the examination and addressed. Laboratory tests such as for urine, haemoglobin and the blood group were conducted in the three health facilities where special laboratory infrastructure was available. HIV and Syphilis were tested at the ANC clinics using rapid tests. However, at some places the tests were only conducted on a weekly or monthly basis in order to decrease work load. After examination, women were given SP for Intermittent Preventive Treatment in pregnancy (IPTp), Mebendazole and iron/folate tablets. However, administration was often constrained by stock-outs as illustrated by Table 11. Health education sessions were usually held either at the beginning or at the end of the ANC visit, but they were only conducted for women attending the ANC clinic for the first time. The main topics were STI and HIV prevention, personal hygiene, diet and nutrition. Information on how to plan and prepare for delivery were hardly addressed here but were brought up during the physical examination.

Table 11: Availability of laboratory tests and drugs at the time of study

	D1	D2 [a]	HC1	HC2
Laboratory examinations				
Urine test	✓	✗	✓	✗ [b]
Haemoglobin	✓	✗	✓	✗ [b]
RPR (Syphilis test)	- [d]	✓	✗ [b]	✗ [b]
Blood group/Rhesus factor	✓	✗	✓	✓
HIV screening	✗ [b]	✗ [c]	✓	✗ [b]
Malaria tests	✓	✓	✓	✓
Drug/Immunization				
Iron/Folic	✗ [b]	✓	✓	✗ [b]
SP	✗ [b]	✓	✓	✓
Tetanus	✓	✓	✓	✓
Mebendazole	✗ [b]	✗ [b]	✓	✓
Hati Punguzo vouchers	✗ [b]	✗ [b]	✓	✗ [b]

[a] laboratory infrastructure not available, [b] lack of drugs or supplies (f.e. gloves, reagents), [c] lack of training to perform the test, [d] no data available

All in all, Figure 10 demonstrates that service delivery varied widely and was generally not according to FANC guidelines: 12 of the services recommended by the FANC guidelines were not given to any women, a further 18 services were given to 3%-58% of women and eight services were given to over 80% of women.
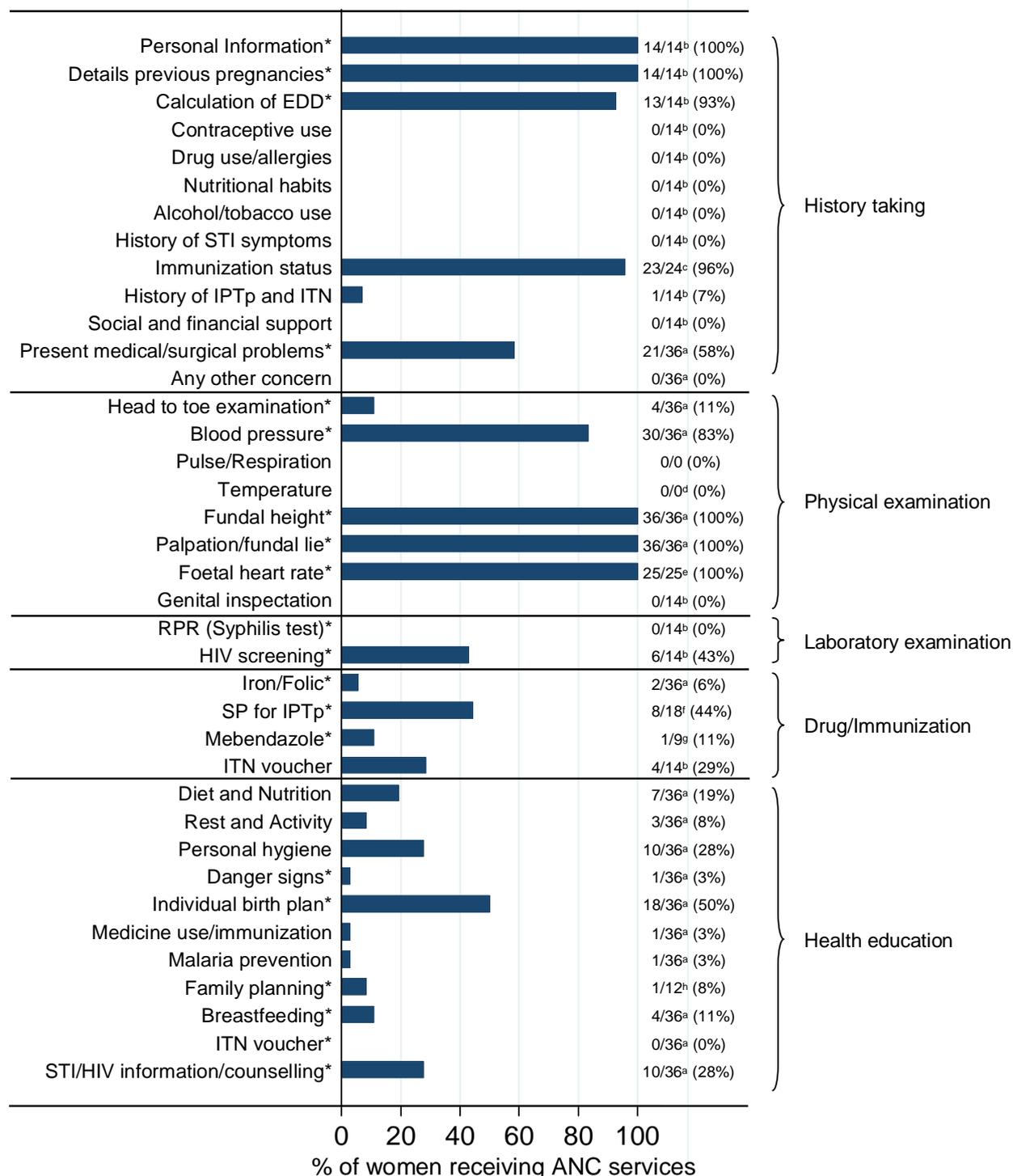
Footnotes: * Services contained on the ANC card (Version 2006), [a] all women, [b] women at first ANC visit, [c] women at the first and second ANC visit, [d] if a woman complains about fever, [e] over 24 weeks of gestation, [f] between 20-24 and 28-32 weeks of gestation, [g] women at second ANC visit, [h] women at third and forth ANC visit

Figure 10: Proportion of pregnant women receiving each of the 38 services recommended by the guidelines

8.4.2. Understanding health worker practices

This section explores reasons for health workers' non-compliance with the FANC guidelines by looking at the context and health workers' practices. Four major themes emerged from the data analysis: 1) absenteeism and lack of training, 2) lack of resources, 3) ANC cards as "working guidelines", and 4) informal rules and routines.

Absenteeism and lack of training

At the time of the study, out of eight health workers routinely working in the four selected RCH clinics only five were present; three of them were trained to provide RCH services (two MCH Aides who worked jointly at one health facility and one nurse midwife) and only one had been trained on the FANC guidelines. This reflects a problem prevalent at all four selected health facilities: staff shortages, absenteeism and lack of training on the FANC guidelines. Table 12 summarizes the availability and qualification of the health workers working at the selected RCH clinics and indicates whether or not they had received training on the FANC guidelines.

Table 12: Characteristics of the health workers working at the selected RCH clinics

Type of health facility[a]	Qualification of health workers (years of training)	Years of work experience	Availability of health workers and reason for absence	Training on the FANC guidelines
D1	Auxiliary nurse (1)	28 yrs	available	No
	Nurse midwife (5)	-[b]	unavailable due to death in the family	Yes
D2	Auxiliary nurse (1)	16 yrs	available	No
	Nurse midwife (5)	-[b]	unavailable due to staff turnover and delay of replacement	Yes
HC1	Certified nurse midwife (4)	24 yrs	available	No
		-[b]		Yes
	Nursing officer with diploma (6)		unavailable due to sickness	
HC2	MCH Aide (2)	26 yrs	available	Yes
	MCH Aide (2)	16 yrs	available	No

[a] Health Centre (HC), Dispensary (D), [b] Missing information (-)

According to the national staffing level guidelines, dispensaries should be staffed with five staff members (2 clinical officers, 2 public health nurses and 1 nurse attendant) (MoH, 1999). However, in each of the two dispensaries selected, only three trained health workers were present at the time of the study. Hence, RCH services were provided by nurse auxiliaries, because the nurse midwives were absent due to staff turnover and the death of a close relative. Nurse auxiliaries receive a minimal training of one year and are reported as being

the most inadequately skilled in identifying women's pregnancy conditions and understanding the national FANC guidelines (Mubyazi et al., 2008). However, often they have experience through many years of working in a dispensary or health centre.

In one of the health centres, a nurse midwife was providing services solely because her colleague (a nursing officer with a degree) was sick. In the other health centre, RCH services were provided by two experienced Mother and Child Health (MCH) Aides, a cadre trained to provide mother and child services at dispensaries and health centres. One of them had been trained on the FANC guidelines. Not surprisingly, health workers complained in the in-depth interviews about the lack of sufficient personnel and described their working situation as stressful.

> "If you would decide to stay a whole day at home [after delivering a baby during the night], there would be nobody here to do the work. Therefore, the nurse goes there (out-patient department) and returns here (RCH department) until she gets exhausted. Vaccines, children, pregnant women, patients, there is always someone". (Auxiliary nurse, D1)

Absenteeism not only left the remaining staff with a higher work load but also with responsibilities that often exceeded the qualification expected for their cadre. In particular, auxiliary nurses had to deal with the dilemma of either treating cases for which they were not adequately qualified or not delivering the services at all. In one case, an auxiliary nurse detected that one of the women had a problem with her breasts. She called the doctor who diagnosed a skin problem and referred her to the hospital. After the doctor had left, the auxiliary nurse uttered uncertainty about what drug to prescribe as the doctor had not advised anyone. In another dispensary, the auxiliary nurse was not allowed to perform HIV tests because she had not participated in the training seminar. A nurse midwife had been sent to the seminar, but she had left the facility in the meantime. Pregnant women were therefore referred to the next health facility at 30 km distance in order to be tested for HIV (Table 10).Training on the FANC guidelines had been conducted in 2007, however, reportedly due to financial constraints, only one health worker per health facility could be invited. Moreover, health workers with minimal pre-service training were excluded from the training due to the plans of the Ministry of Health and Social Welfare to phase out this cadre (Personal communication, District RCH coordinators).

Lack of resources

All interviewed health workers expressed frustration with the given work situation at their health facilities. In particular, complaints arose about lacking drugs and supplies needed for laboratory investigations. Table 11 summarizes the availability of laboratory tests and drugs

at the time of the study and shows that even at the three health facilities where laboratory infrastructure existed, some of the tests could not be performed due to stock-outs of supplies such as gloves or reagents. Drug shortages prevented the delivery of SP or Mebendazole used for the prevention of malaria and soil-born diseases among pregnant women. At one dispensary where SP was out of stock, pregnant women were sent to the nearby drug shop in order to buy SP. At two other health facilities, health workers reported that they manage to restock needed items by obtaining them thanks to established relationships with the staff of a neighbouring health facility or a drug shop.

> "If we have shortages of SP, we usually go to request it [at the district] or we go to the neighbouring health facility. If we run out of [SP] we go to ask there". (Nurse midwife, HC1)

> "If the supplies are available in the nearby drug shop, we run over to borrow them to get them without troubling people. Later on when the facility gets them they go to pay because we have a close relationship with the shop here. Apart from things like razors and gloves we buy small things there, if we don't have them". (MCH Aide, HC2)

User fees had been introduced in the early 1990s in the study area either in the form of consultation fees or prepayment (f.e. Community Health Funds) with the aim of enhancing facilities' ability to improve their quality of care. However, buying drugs from providers other than the Tanzanian Medical Stores Department (MSD), which is the official drug supplier, is mostly not an option, because funds from consultation fees are not foreseen for the purchase of drugs but rather for minor repairs, the purchase of kerosene or the payment of watchmen. Community Health Funds that could be used for the purchase of drugs are often not accessible to health facilities due to high administrative burdens.

ANC card as "working guidelines"

Observations and informal conversations showed that the FANC guidelines did not play a large role in guiding the daily work of the health workers. In three of the four health facilities, health workers did not know whether the FANC guidelines were actually available at the health facility or not. ANC cards, however, provided an important working tool for them. Health workers used the card as continuous patient documentation and registered personal information, physical examinations, laboratory tests, and drug and health education delivery. Pregnant women were supposed to bring the card to each visit, and the ANC card structured the delivery of the ANC services. Unfortunately, the ANC cards (Version 2006) only cover a subset of the services recommended in the FANC guidelines (see services marked with * in Figure 1). This might explain why some of the recommended services were not delivered to

the women (see Figure 10 and Table 13). History-taking, for example, was reduced to those four elements for which information is requested on the ANC card. Other information, such as on contraceptive use, IPTp use and Insecticide Treated Nets (ITN) utilization, as well as on social and financial support, was not collected, since health workers were not able to register the data anywhere. Table 13 illustrates that health services for which information was requested on the ANC card were delivered far better than services recommended by the FANC guidelines but not listed on the ANC card.

Table 13: Consistency between information requested on the ANC card and service delivery

ANC card	Service delivery		
		n/N	%
Information requested on ANC card [N=20]	Services delivered to at least 50% of the women	9/20	45
	Services not delivered to any woman	2/20	10
Information not requested on ANC card [N=18]	Services delivered to at least 50% of the women	1/18	6
	Services not delivered to any woman	10/18	55

Rules and routines

In all selected health facilities, daily clinic activities were guided by informal rules and routines that had been introduced in order to cope with the perceived high work load. Although officially the selected health facilities provided ANC services daily, in reality pregnant women came for their first ANC visit only on certain days of the week. Health workers explained that specific attendance schedules had been introduced several years ago at the health facility level in order to cope with the increased work load due to the introduction of HIV tests. At some health facilities, schedules for laboratory tests existed in order to reduce the work load. In one of the dispensaries, syphilis tests were only offered on a monthly basis, while in another health facility HIV tests were performed on Thursdays only. Pregnant women were supposed to return to the ANC clinic on the specified day to get tested. Organizational rules had been created by the individual health facility teams without consulting the district authorities. As the district authorities promote daily ANC services, these informal rules not only conflicted with the national FANC guidelines but also with district aims.
Observation showed that the individual health workers enforced informal rules and routines more or less strictly. Although they were usually interacting with their clients in a friendly and joking manner, sanctioning of women was observed, especially in one health facility. An auxiliary nurse refused to examine some of the pregnant women, sent them back home or

told them off because they did not obey the health facilities' organizational rules. On one occasion, the nurse did not attend a woman who made her first ANC visit on a day not scheduled for first attendees and told her to come back on the correct day. On another occasion, she scolded a woman who had lost her ANC card when her house caught fire. The auxiliary nurse asked her to prove the incident with a confirmation letter from the village leader if she wanted to get another ANC card for free. These examples illustrate that health workers were in a position to interpret and enforce existing informal rules in an individual way. By sanctioning the women for their non-compliant behaviour they demonstrated power and exerted hierarchical control over their clients. Whether health workers made use of this opportunity or not depended on their individual work motivation, their confidence in working skills and on their relationship with the women.

8.5. Discussion

The findings of this exploratory study in four rural ANC clinics in south-eastern Tanzania confirm evidence from previous studies on poor quality of ANC provision in Tanzania and other countries (Boller et al., 2003, Gilson et al., 1993, Magoma et al., 2010, Mrisho et al., 2009, NBS and MEASURE DHS, 2005, Ouma et al., 2010, Urassa et al., 2002, von Both et al., 2006, Zanconato et al., 2006). Observation of ANC consultations revealed that the provision of ANC services varied widely and was not in accordance with the FANC guidelines; some of the services that pregnant women were supposed to receive were not delivered to any of the women, while others were given to nearly all women (see Figure 1). Performance during return visits was particularly poor. Consistent with previous quality assessments of Boller et al. (2003) in public and private ANC clinics in Dar es Salaam, Sarker et al. (2010) in the Rufiji District, and Gilson (1993) in the Kilombero Valley, this study revealed critical gaps in clinical and laboratory examinations and drug administration. Furthermore, our results are supported by a study of von Both et al. (2006) who found major discrepancies between current ANC practice and the requirements of the FANC guidelines, especially in health education and counselling.

This study was based on a small sample of four rural ANC clinics, and its results might not be applicable to other countries or even to other settings in Tanzania. Nevertheless, using a combination of different qualitative techniques, the study's in-depth exploration of health workers' practices and working context extends the available evidence. It offers new interesting and relevant insights for understanding determinants of health workers' ANC provision in a rural, resource-constrained setting that should be investigated at a larger scale.

First, the findings clearly demonstrated that in all four health facilities, lack of trained staff and absenteeism was critical. Out of eight health workers routinely working in the four selected RCH clinics, only five health workers were present at the time of the study. Among these, three health workers had the skills to provide MCH services (two MCH Aides working jointly in one of the health facilities and one nurse midwife) and only one had been trained on the FANC guidelines. This reflects not only a critical shortage of skilled health work force, but also raises questions about the implementation of the FANC guidelines. Given that only one health worker in the four selected health facilities had been trained on the FANC guidelines, non-adherence to the guidelines is no surprise. The low availability of skilled staff at the health facilities might not be representative of other regions as at national level a high proportion of pregnant women are reported to receive ANC services from nurse midwives (70%) (NBS and MEASURE DHS, 2005). At the same time, several studies revealed that understaffing of qualified health staff is worst in rural dispensaries of the public sector (Koblinsky et al., 2006, Mamdani and Bangser, 2004, Olsen et al., 2005). This study provided evidence that unskilled staff, left without the support of their absent colleagues, not only had to deal with a high workload but also to handle cases for which they were not trained. This could lead to frustration and put pregnant women's health at risk (Manongi et al., 2006). Efforts should, thus, focus on training all health workers on the FANC guidelines. Moreover, based on the study's finding that health workers who are least skilled are often highly experienced and need to take over the responsibilities of their trained colleagues when they are absent, this group should not be excluded from training opportunities. Instead, considering the critical shortage of adequately skilled health staff, efforts need to be made to enable them to adequately deliver the basic services required at the dispensary level. Providing them with prospects for training and career development not only has the potential to improve their skills but might additionally result in a positive spill-over effect of increasing their motivation to work in a rural setting (Manzi et al., 2004).

Second, the study pointed to the important role that ANC cards played in health workers' daily provision of ANC services compared to the FANC guidelines. This is probably because of health workers' lack of training on the guidelines. In fact, ANC cards served as institutionalized "working guidelines" and adherence to the cards' instructions was high. Figure 1 demonstrates that ANC service delivery followed the items listed on the ANC cards but did not cover the whole spectrum suggested by the FANC guidelines due to differences between the ANC cards and the FANC guidelines. This finding ties in with insights of Rowe et

al. (2002) and Walter et al. (2009) on the Integrated Management of Childhood Illness (IMCI) strategy. They report how differences between the national reporting system and the guidelines had a similar impact on the quality of IMCI diagnoses: health providers diagnosed and treated sick children narrowly because they based their diagnoses on the requirements of the Health Management Information System (HMIS) instead of the more complex IMCI guidelines. Eliminating discrepancies between the FANC guidelines and the ANC cards would provide health workers not only with user-friendly "working guidelines" but might also constitute an easy and promising approach to improve the performance of even those health workers who have never been trained on the FANC guidelines.

Third, the findings clearly confirmed the impact of the lack of material resources and health system failures on the quality of ANC provision. Health workers were struggling on a daily basis with stock-outs of laboratory supplies and drugs due to weak health infrastructure and health system failures. Policies introduced to mitigate health system failures, such as user-fee schemes, proved not to be functional. The study, thus, complements other studies on the impact of non-availability of resources on health workers' performance (Rowe et al., 2005). While some point out that the lack of resources might cause serious dilemmas for health workers' decision-making (Akinsola, 2001, Manongi et al., 2006, Mathole et al., 2005), others stress its negative impact on health professionals' work motivation (Franco et al., 2002a, Manongi et al., 2006, Manzi et al., 2004). As Reis et al. (2005) show, it might also lead to health workers' discriminatory behaviour towards clients, if, for example, they have to attend HIV patients but lack protective and other materials to treat and prevent the spread of HIV.

Finally, our study contributes to evidence showing that health workers may react to a complex and often stressful working environment created by lack of training, staff shortages and resource constraints by adopting coping strategies in the form of predatory behaviour and brain drain (Kyaddondo and Whyte, 2003, Van Lerberghe et al., 2002) or with "street-level bureaucracy" (Walker and Gilson, 2004). This term was coined by Michael Lipsky (1980) who emphasized on the one hand the critical role of front-line health workers in delivering public services, and on the other hand their struggle to cope with contextual factors such as lack of adequate organizational and staff resources. Hence, front-line workers, including health workers, develop and implement informal practices in order to cope with the high demand for their services and the difficult working situation. Informal practices are difficult to identify as they are usually not consciously reflected. As a result, few studies have examined them with regard to health care and especially ANC. An exception is Mathole et al.

(2005) who explored women's and health workers' attitudes towards the implementation of a new ANC package in Zimbabwe and also showed health workers introducing informal organizational rules in order to cope with a high work load. While difficult working conditions certainly force health workers to create routines that allow for mass treatment such as health education sessions in groups, there is also reluctance to change these long-established routines, for example by introducing more time-consuming individual counselling. Informal rules and routines often contradict official regulations and might be misused by individual health workers in order to demonstrate power and exert hierarchical control. They should therefore receive more attention within research. However, in some cases informal practices may also lead to positive outcomes. Our study indicates that health workers revealed a surprising ability to mobilize lacking drugs and supplies from alternative sources by drawing on established relationships with neighbouring health facilities and shops. Supportive supervision could have the potential not only to support positive outcomes but also to prevent dangerous consequences of informal practices.

8.6. Conclusions

This rigorous though exploratory analysis gives summary measures of quality of ANC and reveals important determinants of health providers' (non-)compliance with the national FANC guidelines. Moreover, it provides a basis for initial lessons about how to strengthen ANC provision in a rural resource-constrained setting.

The study illustrates that for ANC services to be effective and meet standards, both trained staff and material resources are required. However, conditions in Tanzania are often insufficient, particularly in rural areas where resources are even more constrained. Factors influencing the quality of ANC provision may lie outside the control of health workers, and force them to come up with their own informal strategies to cope with the situation. Improvements of working conditions should focus on the remedy of supply shortages and the strengthening of human resources. This means provision of opportunities for training and career development for those who belong to the least-trained health worker cadres. The high compliance with the ANC card reported in this study provides promising evidence that health workers' performance can even be good under constrained conditions. Performance targets need to be well defined, institutionalized and achievable and take the often difficult working context of health workers into account. Furthermore, researchers and policy-makers should give more attention to the detection and identification of informal practices caused by "street-level bureaucracy" and individual coping strategies. Problems caused by informal practices need to be tackled before they become part of the organizational culture. Regular supervision

and participatory solution-finding are key strategies. Routine ANC provision must build on the social resources available in the health system. Thus, positive outcomes of health workers' coping strategies as observed in this study need to be fostered by supporting the exchange between peers and health facilities.

8.7. Authors' contributions

KG was involved in the design and implementation of the study, field work, data management, analysis and interpretation of the data, and writing of the manuscript. BO, FK and JS supported the design of the study. JS, FK, CP, BO contributed to the manuscript. All authors have read and approved the final manuscript.

8.8. Competing interests

The authors declare that they have no competing interests.

8.9. Acknowledgements

9. "Workhood" – A useful concept for the analysis of health workers' resources? An evaluation from Tanzania

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9.1.   Abstract

9.1.1. Background

International debates on improving health system performance and quality of care are strongly coined by systems thinking. There is a surprising lack of attention to the human (worker) elements. Although the central role of health workers within the health system has increasingly been acknowledged, there are hardly studies that analyze performance and quality of care from an individual perspective. Drawing on livelihood studies and sociological theory of capitals, this study develops and evaluates the new concept of workhood. As an analytical device the concept aims at understanding health workers' capacities to access resources (human, financial, physical, social, cultural and symbolic capital) and transfer them to the community from an individual perspective.

9.1.2. Methods

Case studies were conducted in four Reproductive-and-Child-Health (RCH) clinics in the Kilombero Valley, south-eastern Tanzania, using different qualitative methods such as participant observation, informal discussions and in-depth interviews to explore the relevance of the different types of "workhood" resources for effective health services delivery. Health workers' ability to access these resources were investigated and factors facilitating or constraining access identified.

9.1.3. Results

The study showed that lack of physical, human, cultural and financial capital constrained health workers' capacity to act. In particular, weak health infrastructure and health system failures led to the lack of sufficient drug and supply stocks and chronic staff shortages at the health facilities. However, health workers' capacity to mobilize social, cultural and symbolic capital played a significant role in their ability to overcome work related problems. Professional and non-professional social relationships were activated in order to access drug stocks and other supplies, transport and knowledge.

9.1.4. Conclusions

By evaluating the workhood concept, this study highlights the importance of understanding health worker performance by looking at their resources and capacities. Rather than blaming health workers for health system failures, applying a strength-based approach offers new insights into health workers' capacities and identifies entry points for target actions.

9.2. Background

Quality of care strongly influences utilization of health care services and access to effective treatment. However, many studies from different countries of Sub-Saharan Africa have reported poor quality in terms of diagnostics and case management (Eriksen et al., 2007, Font et al., 2001, Krause et al., 1998, Pfeiffer et al., 2008, Zurovac and Rowe, 2006). Other studies highlight the impact of health workers' bad attitudes towards their clients on quality of care (Hadley and Roques, 2007, Jewkes et al., 1998b, Kyomuhendo, 2003, Reis et al., 2005). Furthermore, health workers' discrimination and lack of respect towards the very poor and vulnerable is a theme that emerges in a number of studies (Mamdani and Bangser, 2004, Reis et al., 2005, Tibandebage and Mackintosh, 2005). Informal economic activities of health workers lead to exclusion, impoverishment and abuse of the poorest (Mbindyo et al., 2009, McPake et al., 1999).

Shortages of health service inputs (trained staff, drugs and equipment) are facts in many health facilities in low income settings (Mbindyo et al., 2009). However, due to a tendency of perceiving bad performance as a problem of human resource management, there has been little attention to what access to resources means to health workers as social actors (Kyaddondo and Whyte, 2003). Also Franco and colleagues (2002a) noted the 'surprising lack of attention to the human (worker) elements'. Some recent studies from Scotland and Australia on health professionals working in remote communities provided evidence that health workers' access to resources is pertinent for their capacity to contribute to the social sustainability and health outcomes in their rural communities (Farmer and Kilpatrick, 2009, Farmer et al., 2003, Kilpatrick et al., 2009). Drawing on Bourdieu's theory of capitals, Farmer et al. (2003) showed that in particular social and cultural capital plays a crucial role. Health workers employed by the health system and living within their community, obtain an intimate understanding of the local culture and have networks inside and outside the community. As "boundary crossers" they are in an ideal position to operate in and across different fields, including health (Kilpatrick et al., 2009).

Innovative livelihood studies have recently been applied to study how people mobilize livelihood assets (human capital, social capital, physical capital, natural capital and financial capital, see Table 14) on the household and community level in order to cope with health risks and gain access to health care (Chuma, 2005, Obrist et al., 2007, Obrist et al., 2010a). Drawing on the Sustainable Livelihood framework of the United Kingdom Department for

International Development (DfID, 1999) Obrist et al (2007) developed the Health Access Livelihood Framework (Figure 11). While the Sustainable Livelihoods Framework has mainly been used in relation to agriculture, poverty and development the Health Access Livelihood Framework linked studies on treatment seeking and health services with livelihood approaches and shifted its focus on people's access to critical resources during treatment-seeking. Studies explored people's way of mobilizing, combining and transforming capitals on the household and community level in order to access treatment for malaria (Chuma, 2005, Obrist et al., 2007, Obrist et al., 2010a) and other health problems (Obrist, 2006). Social relationships with relatives, neighbors or friends might therefore be transformed into financial means needed to pay health costs or borrowing a bike for the transport of a sick person (Chuma, 2005, Obrist et al., 2010a). Emphasis is given to the actors' capacity to not only cope and adjust to adverse conditions, but actively and creatively search for options (Obrist et al., 2010a). Access as the "ability to derive benefits" from a resource (Ribot and Peluso, 2003:153) is a key issue and has been stressed in the Health Access Livelihood Framework (Obrist et al., 2007). However access to resources is strongly influenced by broader structures (role of government, private sector and donors) and processes (organizational, institutional, policy and cultural factors) in society (DfID, 1999, Obrist et al., 2007).

Table 14: Comparison of livelihood and workhood resources

	Livelihood assets (DfID, 1999)	Workhood assets
Definition	A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living	A workhood comprises the capabilities and assets (material, social and cognitive resources) and activities required to fulfill job requirements
Human capital	Knowledge, skills, ability to work, good health	Size of available work force willing and able to work
Physical capital	Basic infrastructure and production equipment and means (transport, buildings, water supply and sanitation, energy, information)	Basic infrastructure (buildings, transport, electricity, water and sanitation) and production equipment and means (supplies and drugs)
Financial capital	Regular inflows of money and stocks (savings, credits, remittances and pensions)	Regular inflows of money and savings through the collection of user-fees
Natural capital	Natural resource stocks (land, forest, marine/wild resources, water)	-
Social capital	Vertical and horizontal networks, membership in formalized groups, relationships of trust, reciprocity and exchange	Vertical and horizontal networks inside and outside the community and within the health facility leading to relationships of trust, reciprocity and exchange
Cultural capital	-	Everyday perceptions, knowledge, skills and professional degrees gained through socialization that find its expression in particular professional culture
Symbolic capital	-	Power-related resources such as prestige, reputation and recognition gained through the possession of other capitals (economic, social, cultural, human).
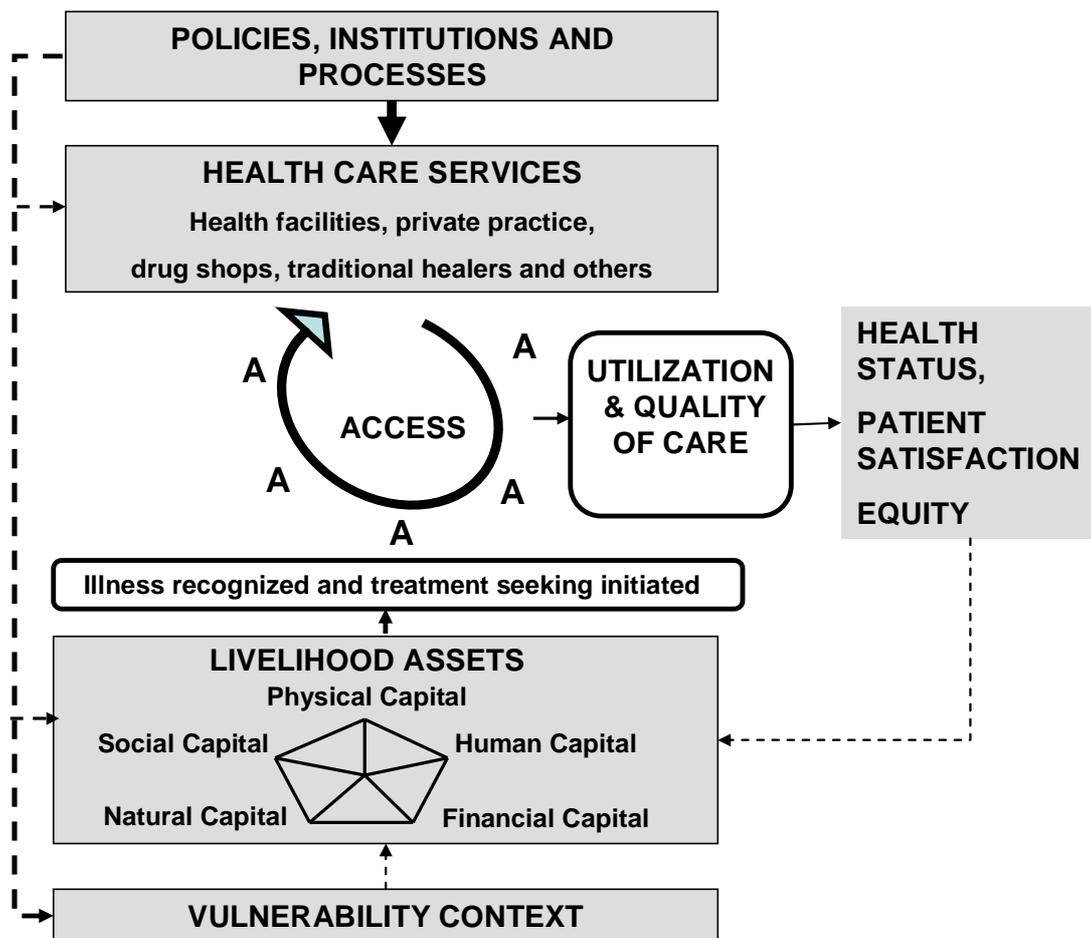
Figure 11: Health Access Livelihood Framework
Obrist et al. (2007)

Obrist and her colleagues understand social actors as the "potential driving force for improving access to effective and affordable health care" (Obrist et al., 2007), at least on the level of those who seek care. However, they pay little attention to social actors delivering health services. Reflections on access to health care are rather coined by a health system perspective. By adapting the insights of the innovative livelihoods research to the health workers' agency we like to expand the Health Access Livelihood Framework by the new concept of workhood (see Figure 12). By workhoods we mean the many forms of health workers' resources, capacities and activities required to provide effective health services to the community. By looking at workhoods the focus is laid on the individuals' actions in a given context rather than on their working environments or the health system. We understand health workers as social actors that are in a position to actively improve health and well-being

of their clients and patients by mobilizing, combining and transforming assets. At the same time their agency is influenced and constrained by given structures (Giddens, 1984) such as the vulnerability context (e.g. magnitude of health problems) and policies (e.g. health laws), institutions (e.g. the private sector) and processes (e.g. health system logistics, see Figure 13). Health workers' access to "workhood" resources is a key issue for the provision of effective health services – especially in resource poor settings. Given that health workers must integrate their professional and private lives (Kyaddondo and Whyte, 2003), we acknowledge their double need for livelihoods – to gain their own living – and workhoods – at work. Although we are aware of the potential interference, we shall focus on workhoods only.
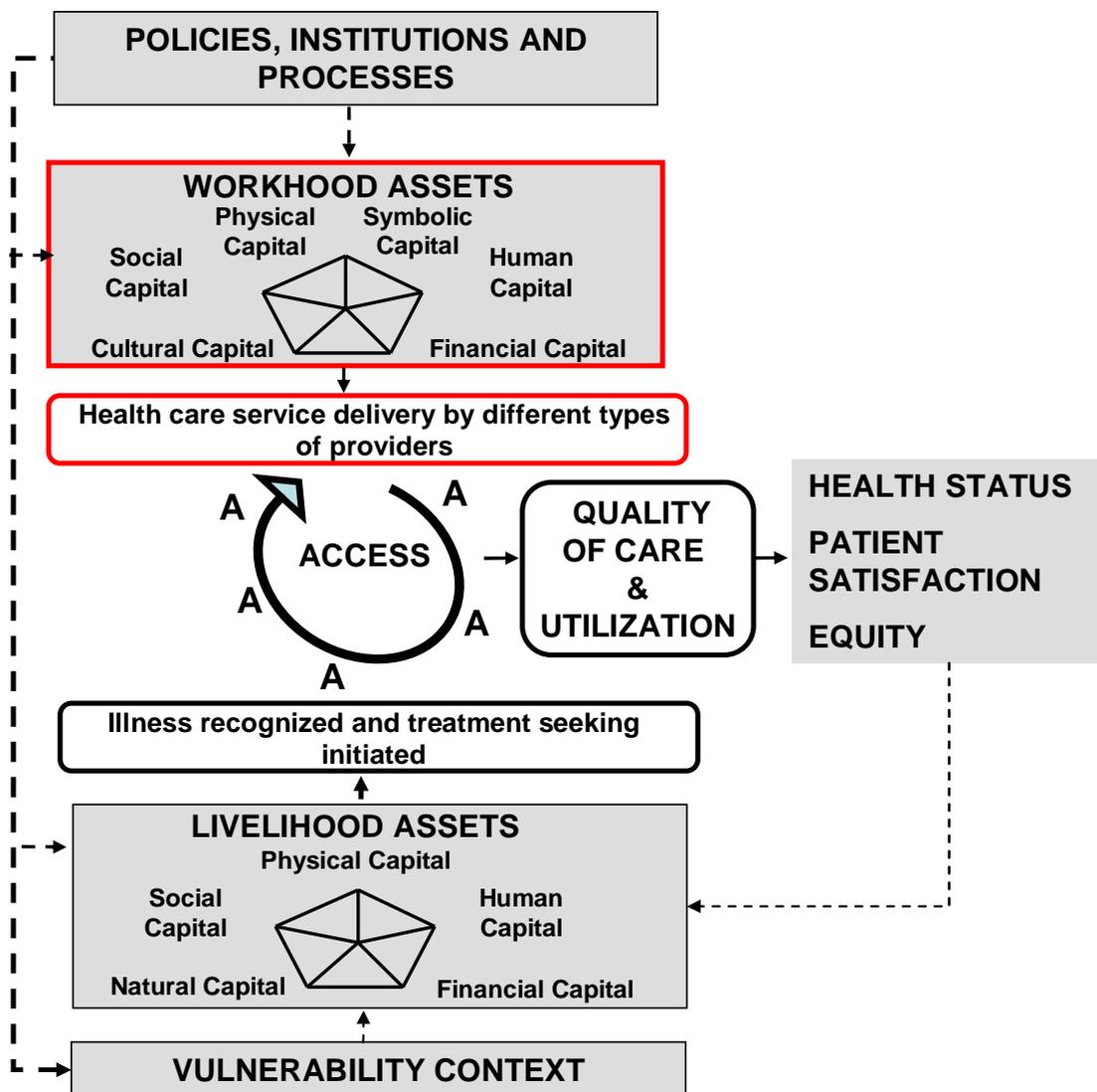
Figure 12: Expanding the Health Access Livelihood Framework by workhood
Adapted from the Health Access Livelihood Framework by Obrist et al. (2007)
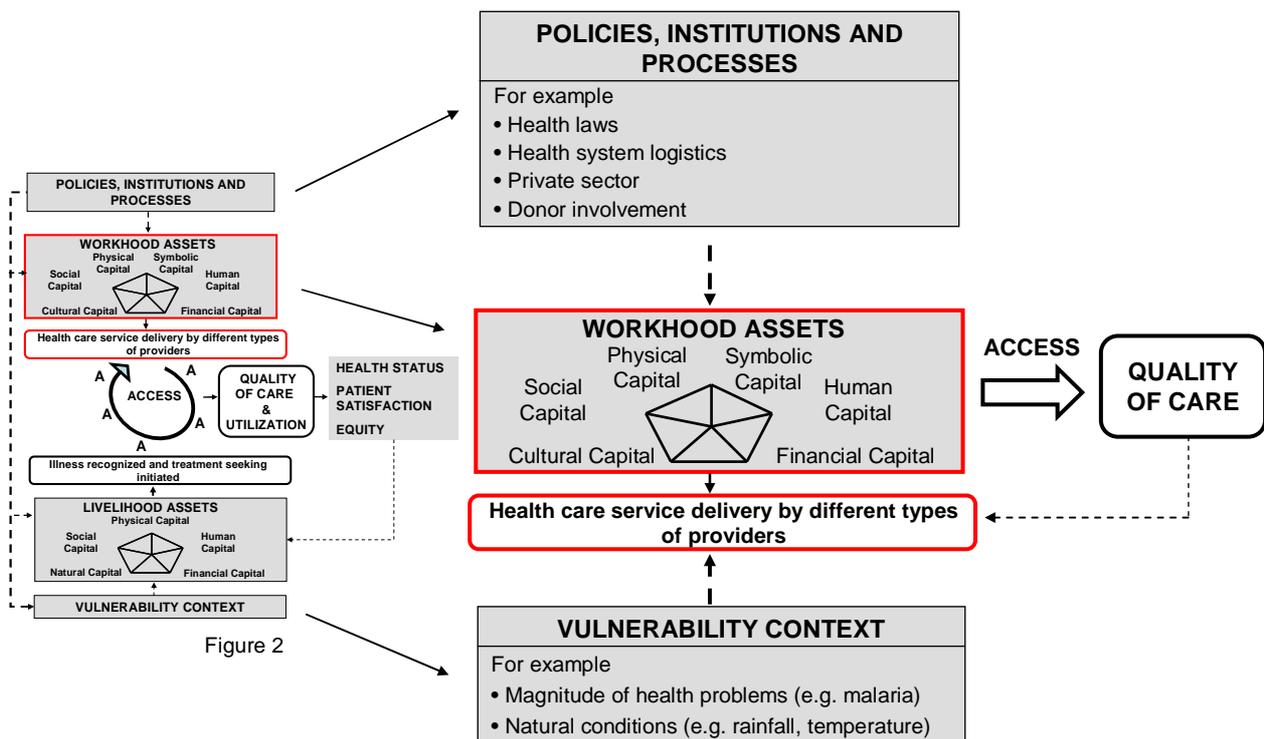
Figure 13: The concept of workhood

This exploratory study aims at contributing new insights to the research of health workers' resources and capacities – a field that has not yet been investigated much – by pursuing three objectives. Firstly, it investigates the relevance of each type of workhood resource for effective health service delivery. Secondly, it explores health workers' ability to access these resources. Given that various structural and relational processes shape health workers' capacities to access resources, we analyze the means, processes and mechanisms that facilitate or constrain their access. Finally, the potential value of the workhood concept for future research is discussed. To do so, case studies were conducted in four rural Reproductive-and-Child-Health (RCH) clinics in south-eastern Tanzania using qualitative research methods. By health workers we refer here to trained nurses and untrained nurse assistants working in RCH clinics of government dispensaries and health centres (Table 15).

Table 15: Human and physical characteristics of the four selected health facilities

	D1	D2	HC1	HC2
Number of pregnant women who attended in 2008 according to HMIS data	625	366	554	1150
Distance to district hospital	47 km	20 km	27 km	64 km
Employed staff at dispensary/MCH clinic (health centre)	1 clinical officer 2 nurse attendants (1 nurse midwife had left for training)	1 clinical officer 1 nurse midwife (absent due to death in family) 1 nurse attendant	1 nurse midwife 1 nurse officer (absent due to illness) 1 Bwana Afya	2 MCH Aids 1 Bwana Afya (absent)
Laboratory available	No	Yes (plans to upgrade dispensary to health centre)	Yes	Yes
Access to main road	No	Yes	Yes	Yes
Ambulance available	No	No	Yes (but under repair at the time of the study)	Yes

D = dispensary, HC = health centre

9.2.1. Health workers and capitals – the concept of workhood

Drawing on the five core categories of capital used in the sustainable livelihood approach of the DfID (1999) as well as on Bourdieu's conceptualizations of capitals, we suggest six categories of workhood assets in order to describe health workers' resources: human capital, financial capital, physical capital, social capital, and – instead of natural capital – cultural and symbolic capital (see Table 14). In the following, the possible relevance of each livelihood capital as a workhood asset and the inter-relationships between the various assets is discussed.

Human capital

In the Sustainable Livelihood Framework, human capital represents the skills, knowledge, ability to labour and good health that enable people to pursue livelihood activities (DfID, 1999). However, given that acquiring knowledge and skills requires social interactions and is shaped by class and culture specific socialization, we adhere to Bourdieu's conceptualization of skills and knowledge as cultural capital. Also, the fact that evidence based medicine is always adapted to local realities suggests that health workers' professional knowledge and skills are part of their cultural capital. Human capital as a workhood resource thus is defined here as the size of the available work force willing and able to work.

Physical capital

Physical capital comprises the basic infrastructure and the production equipment and means on which people draw in pursuit of livelihoods (DfID, 1999, Rakodi, 2002). In health facilities, physical capital refers to buildings, transport, electricity, water and sanitation constituting the basis of a functioning infrastructure, and to drugs and supplies as production equipment necessary for the provision of effective health care. Most of these items are provided by the government, but might also derive from faith-based or other donor organizations. The acquirement of physical capital involves financial investments, logistics and planning of different scales and might require simultaneous skill- and capacity development as for example for new diagnostic and health technology.

Financial capital

Financial capital denotes regular inflows of money as well as stocks. Financial capital thus includes savings, credits, remittances and pensions that people use to achieve their livelihood objectives. It is probably the most versatile, but also the least available asset to the poor (DfID, 1999, Rakodi, 2002). In the course of health sector reforms, many low- and middle-income countries have introduced user-fee systems at government health facilities as a means of mobilizing resources in order to increase the quality and coverage of health services. While salary payments build an important livelihood asset for health workers, financial workhood capital comprises of health facilities' regular inflows of money through the collection of user-fees and their accumulation on bank accounts.

Social capital

There are many debates what the term 'social capital' means. In the context of the Sustainable Livelihoods Framework, social capital has been understood as the social resources that are developed through vertical or horizontal networks, membership in formalized groups and relationships of trust, reciprocity and exchange (DfID, 1999). Hence, social capital is not naturally given but is the result of continuous investment into relationships with other social actors and is bound to obligations, norms and values. Social capital thus constitutes "the ability to secure benefits through membership in networks and other social structures" (Portes, 1998:6). On the other hand, it might be used to constrain opportunities of non-members, to restrict individual freedom and maintain power and status in a social hierarchy (Hawe and Shiell, 2000). Given that health providers working in remote rural communities are deeply embedded in their rural communities they obtain social relationships

of mutual trust, reciprocity and exchange within the community but also various vertical and horizontal networks within the health system (Farmer et al., 2003, Kilpatrick et al., 2009, Lauder et al., 2006).

Cultural capital

Drawing on Bourdieu's theory of capitals (Bourdieu, 1986), we introduce cultural capital as a workhood resource. Bourdieu distinguishes three forms of cultural capital: incorporated, objectivized and institutionalized cultural capital (Abel, 2007, Bourdieu, 1986). Incorporated cultural capital comprises on the one hand (professional) skills and knowledge acquired through education and socialization, on the job-training, work experience and through the exchange of information with colleagues. Consequently, health workers are able to understand and use items of objectivized cultural capital belonging to their profession such as books, technical tools, guidelines that are not readily understandable and usable for lay persons. On the other hand cultural capital constitutes of everyday perceptions, skills and knowledge such as lifestyle preferences or the knowledge how to behave properly and interact with others. The incorporation of these resources through socialization is a life long process. Cultural capital becomes part of the individual human body and is not readily observable but rather finds its expression in particular professional cultures encompassing dispositions, values systems, habits, practices and knowledge that are tightly linked to their identity as health professionals (Abel, 2007, Hong, 2001). Health workers' cultural capital therefore can be understood as a specific stock of knowledge [*Wissensvorrat*] in the sense of Schütz and Luckmann (Schütz and Luckmann, 2003). Of course, the "Wissensvorrat" of health workers is not exclusively built on experiences made during work, but interferes with experiences made as a private person. Finally, educational degrees, the institutionalized forms of cultural capital, procure health workers not only with access to the labor market (financial capital) and professional and non-professional networks (social capital) but also grants them symbolic capital in form of social status, prestige and power (Abel, 2007, Bourdieu, 1983).

Symbolic capital

According to Bourdieu symbolic capital is "the form that the various species of capital (economic, social and cultural capital, inserted by KG) assume when they are perceived and recognized as legitimate" (Bourdieu, 1989:17). Symbolic capital encompasses power-related resources such as prestige, reputation and recognition and therefore influences not only actors' capacity to act but also their potential to access other resources (Obrist et al., 2010b).

Health workers working in remote communities usually obtain a considerable amount of symbolic capital due to their cultural but also social and economic capital. This is especially true for poor communities where educational levels are low and only few people obtain a degree in formal training and regular income.

9.3. Methods

9.3.1. The research setting

The Demographic Surveillance System (DSS) area in the Kilombero and Ulanga Districts in South-Eastern Tanzania served as study area. It comprises of 25 villages with an estimated total population of 92'000 in 2008 (Alba et al., 2010). There is a wide mix of ethnic groups including WaNdamba, WaPogoro, WaBena, Wahehe and the newly arrived WaChagga and WaSukuma (Armstrong Schellenberg et al., 1999, Obrist et al., 2010a). During the rainy season from December to April large parts of the Kilombero Valley are regularly flooded by the Kilombero River. This favours the cultivation of rice, which together with maize and cassava builds the main staple food and most important cash crop (Armstrong Schellenberg et al., 1999, Hetzel et al., 2007, Obrist et al., 2007).

In the two districts a dense network of health facilities is available with dispensaries providing a basic range of curative and reproductive and child health (RCH) care to 6,000 to 10,000 people, health centres offering inpatient and higher level care to 50,000 people and hospitals serving as referral points for the facilities (Gilson et al., 1995). At the time of the study, a total of 10 first leven (dispensaries) and two second level (health centres) health care facilities (9 public and 3 private) provided RCH care services on a weekly or daily basis from Monday to Friday and referred cases to two district hospitals. Since the early 1990s government facilities collect user fees. To reduce the impact of user fees on the most vulnerable groups exemption and waiver policies have been installed. Consequently, pregnant women and children under the age of five years are exempted from user fees (Manzi et al., 2005).

9.3.2. Data collection

The study was carried out between May 2008 and May 2009 as part of a wider research project (Gross et al., 2011b). Four government health facilities were selected in the research area for case studies: in each district the only available health centre and one additional dispensary. The selection of the dispensaries was based on the criteria of daily RCH service provision and a high number of pregnant women attending the RCH clinic based on patient registers. A more detailed description of the RCH clinics in terms of staffing, physical infrastructure and attendance numbers is provided in Table 15.

Case studies were conducted using different ethnographic methods: participant observation of daily RCH clinic procedures, informal conversation and semi-structured in-depth interviews with health workers. Out of eight health workers routinely offering RCH services at the selected health facilities, only five were present at the time of the study. Data collection was carried out at each health facility over a 1 week period in July 2008 by the leading researcher who is conversant in Swahili. She was supported by a local non-medical research assistant who could help with nuances of the language.

The method of case studies are valuable to enrich, validate and refine preliminary conceptual frameworks (George and Bennett, 2004) and is particularly appropriate for the exploration of new topics (Eisenhardt, 1989). The theoretical concept of workhood capitals was used as a "frame of reference". Participant observation and informal conversations with the health providers during and after work helped further to understand clinic procedures and clarify questions on infrastructure, work procedures, health providers' responsibilities and patient-provider and provider-provider interaction. During the observations and informal conversations with health workers notes were taken to facilitate remembering activities and events, and were elaborated afterwards in descriptive field notes (Bernard, 2000) in collaboration with the research assistant. The method of participant observation and health workers' high work load led to an involvement of the observers in administrative and registration work. Towards the end of the week, in-depth interviews were conducted with the five health workers available at the RCH clinics during the time of the study. A semi-structured questionnaire was used exploring health workers' training and position, their perceived work problems, their motivations, attitudes and work expectations, and their social relationships and interaction with patients, colleagues and supervisors. The in-depth interviews were tape-recorded after asking for health workers' permission.

9.3.3. Data analysis

The in-depth interviews were transcribed and translated into English by two research assistants fluent in English and Kiswahili. The main researcher reviewed the transcript and original recordings and discussed ambiguities with the research assistants. Interview narratives and descriptive field notes were analyzed with MAXqda2 (VERBI Software, Marburg, Germany) using qualitative content analysis (Mayring, 2007). Analysis focused on observed events and health workers' narratives that were directly or indirectly related to health workers' lack or the mobilization and transfer of work resources in the context of structural forces. Text segments were identified and coded into capital categories. Within-case analysis was coupled with analysis across the four cases in search for patterns as

suggested by Eisenhardt (1989). Contextual knowledge gained during 13 months of field work in health facilities and the communities helped to interpret the findings. Discussions with the RCH coordinators at the two districts in May 2008 and 2009 and reviews of national and international documents provided further background information for the interpretation and analysis of the collected data. Questions arising during the data analysis were addressed in follow-up and feedback visits at the four health facilities in April 2009. Thus, analysis was iterative and developmental as it served 1.) to refine and further develop the initial concept of workhood and 2.) to again evaluated the refined version with the data.

9.3.4. Ethical considerations

The study was conducted within the frame of the ACCESS Programme which was cleared by the National Institution for Medical Research of Tanzania (NIMR/HQ/R.8c/Vol. I/66) (ACCESS Programme, 2008a). Approval was further provided by the review boards of the Swiss Tropical and Public Health Institute (SwissTPH) and the Ifakara Health Institute (IHI). The study was authorized by the district RCH coordinators and the health facility staff granted permission to conduct the study at their facilities. All study participants provided oral or written informed consent after having been explained the purpose of the study and informed of their right to withdraw from the study at any time.

9.4.   Results

This section explores the relevance of each of the six workhood capitals (physical, human, financial, social, cultural and symbolic capital) for health providers' work. Two themes emerged from the data analysis. The first theme describes health workers' experiences of working in a resource-poor setting. It illuminates what categories of workhood assets they were lacking in their daily work and provides health workers' explanations of why they failed to access them. The second theme focuses on how health workers overcame these challenges by mobilizing their own capacities.

9.4.1. Lacking physical capital

Referring to the lack of physical capital, a nurse assistant of a dispensary situated in a remote village off the main road expressed her difficulties with organizing not only an ambulance, but transport in general:

> "We usually have a radio call to communicate with our colleagues over there. Often they
> tell us that unfortunately the ambulance is not available or that it is broken down. If I have
> an emergency case with a pregnant woman the issue of transport really is a problem. [In
> the village] over there, if a pregnant woman has a problem, firstly, there are cars available,

> and secondly, it is situated at the main road. They bring the patients to the main road and get easily transport, but here we get problems" (Nurse assistant, D1)

The comment displays the twin problem of lacking physical capital the nurse has to deal with: on the one hand she can not rely on the health system, on the other hand general infrastructure such as transport means is weak. Moreover, in their daily work with pregnant women, health workers had to deal with the lack of work supplies, such as gloves and reagents needed for diagnostics, and drug shortages. Health workers attributed drug or supply shortages at the facility to either stock-outs at the district level or to the unreliability of the national drug supply system represented by MSD, the Tanzanian Medical Stores Department. Responsible for the procurement and storage of drugs, MSD is the unique supplier of drugs to government, faith-based and other non-governmental hospitals and health facilities (MSD, 2010). Since the implementation of the Indent/Integrated Logistic System, MSD delivers drugs in customized kits according to individual health facility orders. However, health workers complained that MSD often does not supply the quantities ordered or fails to deliver certain drugs at all. Recent studies assessing the medicine supply system confirmed unconformities between the drug quantities ordered and delivered and reported long-term stock outs of essential drugs at MSD (Euro Health Group, 2007, HERA, 2006, MoHSW, 2008a). Moreover, discussions with the health workers and with the RCH coordinators revealed logistical problems at the district level where health workers are supposed to obtain specific items from the medical district store when they experience shortages at their health facility.

> "If we have shortage of drugs and other supplies we usually go to the district [capital] to request them. If they have them they provide us with the supplies but if they don't have them, then doctors tell us to come back another day. We return back to our facility for a while and then go again to the district" (Nurse midwife, HC1)

9.4.2. Insufficient financial capital

In order to enhance facilities' ability to improve their quality of care, in the early 1990s the government of Tanzania introduced user fees either in form of cost sharing or prepayment (i.e. Community Health Funds). Yet, buying drugs from other providers than MSD did not seem to be option for health workers. While one health worker argued that high prices discourage the purchase of drugs from private drug sellers, several other health workers considered the collected revenues to be insufficient to purchase drugs and supplies because of the money's use for other purposes.

> "Now we have this cost sharing, yes. If the situation is good, we can adjust ourselves at the health center by buying these essential supplies which will help the society if money is available. If it is available, then, yes, this money has many uses. For example, those who cut the grass. There are watch-men employed that are paid by the facility. There is a woman who cleans the facility rooms, she is also paid. In reality it is not sufficient, only by squeezing squeezing [the money], yes, like that. We do not have electricity here, we use kerosene lamps [chemli]. This needs kerosene; it has to be bought every day. And as you know, the services of the children and pregnant women is for free, therefore those who are treated are adults, so the earning is not normal, that's the problem" (MCH Aide, HC2).

Although health workers perceived exemptions to be the main cause for insufficient resources, evidence from the literature and the field suggests that low enrolment levels into cost recovery schemes, bad managerial practices and lack of transparency and accessibility hamper the potential for quality improvement (Euro Health Group, 2007, Kamuzora and Gilson, 2007). Government health facilities often only have small shares of the revenues at their disposition and experienced administrative barriers to access money at the district bank account (Euro Health Group, 2007, REPOA, 2004).

9.4.3. Shortages of human capital

Staff shortages were experienced in all selected health facilities. A comparison with the national staffing level guidelines shows that dispensaries theoretically should be staffed with 5 people (2 clinical officers, 2 public health nurses and 1 nurse attendant) (MoH, 1999). However, service provision in the two selected dispensaries was provided by 2-3 people (see Table 15). In both cases, assistant health workers who are minimally trained and often excluded from training courses due to the Ministry of Health's plan to phase them out (personal communication: RCH coordinator) solely provided the RCH services. Not surprisingly, health workers complained in the in-depth interviews about the lack of sufficient personnel and described their working situation as stressful.

> "If you would decide to stay a whole day at home [after delivering a baby during the night], there would be nobody here to do the work. Therefore, the nurse goes there (out-patient department) and returns here (RCH department) until she gets exhausted. Vaccines, children, pregnant women, patients, there is always someone" (Auxiliary nurse, D1).

In the health centres, the situation was better, but the staff still experienced a high level of workload and responsibilities due to absenteeism (see Table 15).

9.4.4. Lacking access to cultural capital

Especially health workers with low education expressed their desire for cultural capital in form of better education. While other health workers were satisfied with the number of seminars they were able to attend in the last years, one health workers expressed frustration because

her intention for further education was dismissed several times. In her explanations she referred to corrupt selection procedures in the past and her lack of social capital:

> "There at the district, in reality they chose especially the children of nurses. All of them went for studies. Now my colleague and me here, we come from the village... No wonder, my colleagues had many strategies, some even brought rice or maize, others they just know each other. We can go to the exams, you complete it, give it a try. No wonder, the name of your colleague was already there, they know who and who will go for studies, you fill it to give it a try" (Nurse assistant, D2)

Lack of access to cultural capital was also highlighted in the case of another nurse assistant who was not allowed to perform HIV testing and counselling because she had not participated in the training seminar. Instead a nurse midwife had been sent to the seminar. However, in the meantime, the nurse midwife had left the facility and was transferred to the district capital illustrating the vicious circle of brain drain as access to cultural capital through institutionalized cultural capital (in form of degrees) raises the chances to be transferred to more convenient work settings.

9.4.5. Social capital to overcome work problems

In-depth interviews revealed that health workers drawing on their own resources pursued a surprising array of strategies to cope with the problem of lacking drugs, supplies and human resources. Mobilizing social capital – and to a lower degree cultural and symbolic capital – played a significant role. In order to restock lacking drugs or supplies, professional relationships with the district authorities were activated either by the health workers themselves or through the doctor in charge. Yet, mobilization of social relationships with neighbouring health facility staff provided a more immediate strategy:

> "If we have shortages of SP, we use to go to request it [at the district] or we go to the neighbouring health facility. If we run out of [SP] what do we do? We go to ask there" (Nurse midwife, HC1)

Moreover, social capital was mobilized to access cultural capital. Health workers reported that they used to share information and knowledge gained in seminars and training courses with colleagues in staff meetings. Thus, knowledge was disseminated through peer education along the lines of professional networks within health facilities. However, health workers also mobilized social capital outside their professional networks in order to address lack of physical capital: In one health facility, social relationships with the drug sellers of a nearby shop had been established over time through regular purchases of gloves and other supplies, and in another one, the health worker relied on her social relationships with a resident

logging company in order to compensate lacking ambulance and transport means in her remote village.

> "If the supplies are available in the nearby drug shop we run over to borrow them to get them without troubling people. Later on when the facility gets them they go to pay because we have a close relationship with the shop here. We buy small things there, apart from things like razors, gloves there, if we don't have them" (MCH Aide, HC2).

> "If the ambulance is not available, we go to discuss it with the people from the Teak Company who are working here. If they have cars available, they help us. If there is no car, if the cars are used for work, it is a problem. But if there are vehicles they do help us, but not for free, the sick woman is supposed to hire the vehicle up to the hospital" (Nurse assistant, D1).

9.4.6. The role of symbolic and cultural capital

The fact that the nurse assistant was able to organize transport from people working for a South-African logging company, points not only to her social but also to her symbolic and cultural capital. After having worked for almost ten years in the community, the nurse assistant obtained knowledge about potential resources and the necessary social relationships to act as a "boundary crosser" (Kilpatrick et al., 2009). Her status as a health professional (symbolic capital) allowed her to interact with people from outside the community who might not be accessible for local people. The example highlights that in order to benefit from such opportunities not only social capital but also cultural capital in form of a thorough understanding of the system and the chances that it offers is important.

9.5. Discussion

This paper sought to contribute to a field that has not yet been investigated much: health workers' access to work resources and their capacities to mobilize and transform them. Expanding the Health Access Livelihood Framework developed by Obrist et al. (Obrist et al., 2007) this paper pursued three aims: firstly, to develop the concept of workhood to capture and explore health workers' resources and capacities, secondly, to illustrate and evaluate this theoretical concept with empirical data from four case studies, and thirdly, to discuss the usefulness and limits of the concept.

Drawing on the Sustainable Livelihood Framework and on Bourdieu's conceptualizations of capitals we developed the workhood concept including six asset categories (Figure 13). Using the workhood notion as an analytical device we illustrated on the one hand what working in resource constraint settings means to health workers. On the other hand we

showed that health workers have some capacities to mobilize and transform resources, thus enhancing their patients' health outcomes.

The case studies illustrated how structural constraints at multiple levels such as health system failures, weak infrastructure at the facilities and chronic shortages of trained staff led to the lack of physical, human, cultural and financial capital. Policies introduced to mitigate health system failures as for example user-fee schemes proved not to be functional. While the impact of lacking infrastructure, drugs and trained staff on health workers' performance and motivation has been stressed by several other studies (Franco et al., 2002a, Manongi et al., 2006, Rowe et al., 2005), little attention has so far been given to health workers' capacities to access and mobilize work related resources from an individual perspective. Our study highlighted that health workers pursued a surprising array of strategies in order to get hold of drugs and supplies (physical capital) and knowledge (cultural capital). Professional and non-professional relationships or networks were activated in order to organize needed resources such as drugs, knowledge and emergency transport. This points not only to health workers' social capital, but also to their symbolic capital – in form of status and recognition – and cultural capital – in form of knowledge about dealing with the civil service bureaucracy and other systems. Our findings support the arguments of a small working group around Farmer and Kilpatrick that in particular health workers' social and cultural capital is pertinent for their capacity to contribute to the social sustainability and health outcomes of their rural community. As Kilpatrick (2009) argues health workers as "boundary crossers" are in an ideal position to operate in and across different fields. They benefit from the over-layering of skills, knowledge and perceptions coming from being a health professional, being a community member and from personal attributes. Thus, they are able to bridge structural holes in social capital networks and foster positive health outcomes (Farmer and Kilpatrick, 2009, Farmer et al., 2003, Kilpatrick et al., 2009, Lauder et al., 2006).

By proving the usefulness of the workhood concept this study offers innovative and relevant insights into a field that has so far hardly been investigated and to earlier access studies in the health field:
Firstly, the concept of workhood constitutes a holistic analytical device that has the potential to inform and guide qualitative and participatory analyses of health workers' performance. It shifts the attention away from health workers' performance as a problem of human resource management. Instead it helps identifying factors at different societal and health system levels

that constrain or enhance health workers' access to workhood resources, thereby providing an understanding for what this means for health workers' daily work experience.

Secondly, rather than blaming health workers for health system failures, with the strength-based approach inherent in the Sustainable Livelihood Framework the application of the workhood concept opens new lines of inquiry. The study showed that health workers not only adapted to the constraining work setting, but obtained considerable capacities for mobilizing drugs, supplies or emergency transport when they were lacking them. The ability to not only cope and adapt but actively and creatively search for options and thus increase their competence in dealing with the constraint work setting is key for resilience building (Obrist et al., 2010b).

As the notion of workhood has been explored in a limited geographical setting and with a very small sample size, the generalization of these results is difficult. Thus, the value of the workhood concept needs to be further explored and tested in different geographical and institutional settings, and – more importantly – in combination with the livelihood concept. An expanded Health Access Livelihood Framework (see Figure 12) has the potential to better explain how people in interaction with individual health workers (rather than an anonymous health system) gain access to health care. However, health workers need to be understood as social actors whose performance not only depends on their access to resources but also on their own interests. What activities health workers adopt and the way they invest in resource mobilization and translation to clients is certainly driven in part by norms and values at the community and the health system level, but is also governed by their own (livelihood) priorities, attitudes and motivation. Ignoring health workers' own and their families' livelihood goals and activities, we left out an important factor influencing health workers' performance and the availability of work resources. Future studies should thus focus on the inference of workhoods with health workers' livelihoods.

9.6. Conclusions

The study contributed to a small but increasing number of innovative livelihood studies focusing on access to health care and drew our attention to a new field: health workers' access to work resources and their capacities to mobilize and transfer them to the community.

Our study illustrates that applying the holistic and strength-based workhood concept to explore health workers' performance, allows for a better understanding of health workers' capacities to access and mobilize resources. The study showed that lack of physical, human, cultural and financial capital constrained health workers' ability for performance. At the same time they had learned how to cope with difficult working situations and pursued a surprising array of strategies in order to mobilize drugs, supplies, and transport means when resource shortages arise. Health workers' social, cultural and symbolic capital thereby played a significant role. The paper does not seek to romanticize the role of health professionals in rural areas, but intents to emphasize the need to explore health professionals' role in rural resource poor settings in a more holistic and in-depth way rather than blaming them for health system failures.

9.7. Authors' contributions

KG was involved in the design and implementation of the study, field work, data management, analysis and interpretation of the data, and writing of the manuscript. BO and CP supported the design of the study and contributed to the manuscript. All authors have read and approved the final manuscript.

9.8. Competing interests

The authors declare that they have no competing interests.

9.9. Acknowledgements

10.   Overall discussion and conclusions

The main aim of this thesis was to contribute to a better understanding of women's access to and use of IPTp and other ANC services in the rural setting of the Kilombero Valley. This thesis provided estimates of the IPTp coverage in the study area, it investigated IPTp and ANC utilization on the demand side and quality of care on the supply side and identified and explored factors influencing women's utilization of ANC services and health workers' ANC and IPTp provision with special focus on institutions as social determinants. In this section, firstly, the main results are summarized and discussed. Secondly, the study setting and design used for this research are critically discussed. Finally, building on the study's findings recommendations for research and practice are formulated.

10.1. IPTp coverage in the Kilombero and Ulanga DSS

Our study revealed a high IPTp first dose coverage (78%) close to the Tanzanian target of providing 80% of all pregnant women with IPTp by 2012 (NMCP, 2007). However, contrary to this very encouraging result, second dose coverage was poor at 27%. Compared to national IPTp data from reports on the Tanzanian National Voucher Scheme (TNVS) (Marchant et al., 2009, Marchant et al., 2008a), the Tanzanian Demographic and Health Survey (TDHS) 2004-05 (NBS and MEASURE DHS, 2005) and the Tanzanian HIV and Malaria Indicator Survey (THMIS) 2007-08 (NBS, 2008) our study found a much higher level for the first IPTp dose; but second dose levels were consistent (Figure 12). Differences between our own and the national data might be explained by the study site being a DSS area and also by regional variations. THMIS data from 2007-08 indicated that IPTp coverage levels in Morogoro region were much higher than national average at 69% compared to 57% for the first dose and 44% compared to 30% for the second dose (NBS, 2008).

Analysis of HMIS data collected from health facility registers suggested a considerable increase in IPTp coverage in the area between 2006 and 2008 (Figure 12). Although this trend has been supported by reports on increasing SP stock levels at health facilities during this period of time (Alba et al., 2010), a close look at Figure 12 suggests that the observed increase in administered IPTp doses might be biased by improved data recording at the health facilities due to our regular data collection and feedback (Marchant et al., 2008a, Marchant et al., 2009, NBS, 2008, NBS and MEASURE DHS, 2005). This would support the statement of Alba (Alba et al., 2011) that more accurate data is only achieved after some time of data collection.
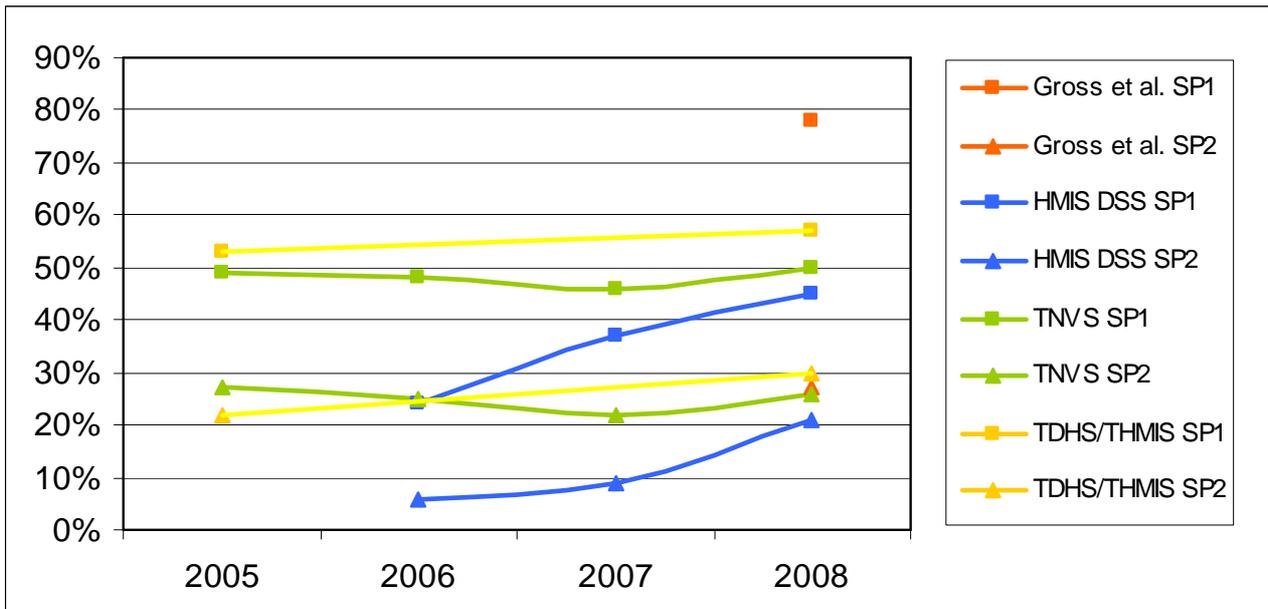
Figure 14: IPTp coverage compared to national data

10.2. IPTp and ANC in practice

Whether women receive IPTp as recommended by guidelines greatly depends on the interplay of women's early and frequent ANC attendance and on health workers' IPTp provision during women's ANC visit. This thesis thus aimed at understanding aspects of ANC utilization as well as ANC quality of care.

Our study showed that the majority of pregnant women (71%) started ANC later than recommended by WHO and the Tanzanian Ministry of Health but within averages reported from the national level (Marchant et al., 2009, NBS and ICF Macro, 2011) and averages from the study area (Spangler and Bloom, 2010). Contrary to concerns raised by local health workers and researchers (Akinleye et al., 2009, Kiwuwa and Mufubenga, 2008, Launiala and Honkasalo, 2007), this study could not identify women's late ANC initiation as the main constraining factor. Instead, a high proportion of women was found to visit the ANC clinic during the two IPTp delivery periods but did not receive the SP dose. However, IPTp provision depended heavily on health worker's IPTp and ANC provision practices and policy issues. Health workers were found to adhere well to the *restrictive* IPTp schedule but to administer IPTp to significantly less women during the second IPTp period than during the first one (55% vs. 73%) despite their good knowledge of the IPTp strategy. This finding supported several other recent studies from Tanzania (Anders et al., 2008, Marchant et al., 2008b) and elsewhere (Sangare et al., 2010, van Eijk et al., 2005, van Eijk et al., 2004,

Ndyomugyenyi and Katamanywa, 2010) reporting a high number of missed opportunities. Additionally, it underlines the conclusion of Anders et al. (2008) and Ndyomugyenyi and Katamanywa (2010) that efforts to encourage timely and frequent ANC attendance alone are unlikely to improve the uptake of IPTp if other barriers are not abolished.

10.3. Understanding practice

Applying an institutional perspective (North, 1990) this thesis allowed to better understand factors influencing women's ANC utilization and health workers' provision of IPTp and ANC services. Unravelling the linkages between institutional arrangements, context and practice it illustrated 1) how formal and informal institutions at the health system level influence health providers' implementation of health policies and guidelines concerning IPTp and ANC and 2) how old and new institutional arrangements at the household and community level influence women's access to and use of ANC and IPTp services.

10.3.1. From policy to health care practice

The thesis showed that clinical guidelines based on research evidence which are widely accepted to provide "best practices" for health interventions (Wood et al., 1998) only do so if they are well implemented. The example of dichotomous IPTp schedules illustrated that health workers continued to deliver IPTp according to restrictive IPTp schedules although a more simplified IPTp schedule had in the meantime been recommended by WHO and also been partially included in the Tanzania's FANC guidelines. Calculations showed that effective implementation of the latter guidelines could potentially increase IPTp coverage by up to 20% and supported the call of others for a revision of the national IPTp guidelines (Anders et al., 2008, Marchant et al., 2008b, Ouma et al., 2010).

Revealing critical gaps in clinical and laboratory examinations and drug administration, including IPTp, our findings confirmed previous quality assessments in public and private ANC clinics in Dar es Salaam (Boller et al., 2003), in the Rufiji District (Sarker et al., 2010, Urassa et al., 2002) and in the Kilombero Valley (Gilson et al., 1993). In line with a study by von Both and colleagues (2006) further discrepancies between current ANC practice and the requirements of the FANC guidelines were found especially regarding education and counselling. Our study supported several of these studies reporting on health workers' lack of adherence to guidelines and treatment standards in ANC (Boller et al., 2003, Gilson et al., 1993, Urassa et al., 2002, von Both et al., 2006). In fact, FANC guidelines did not play a role in guiding the daily work routine of the observed health workers. Instead, this thesis showed that health workers preferred using the ANC card as institutionalized "working guidelines" to

guide daily routines than the more complex FANC guidelines similar to reports by Rowe et al. (1999) and Walter et al. (2009) with regard to IMCI. Adherence to the cards' instruction was high and analysis showed that health services for which information was required on the ANC card were delivered far better than services not listed on the ANC card but recommended by the FANC guidelines.

Besides formal institutions embedded in the health system such as health policies, guidelines and regulations, health workers' health care practices were found to be clearly shaped by informal rules and routines. Difficult working conditions constrained by lack of trained staff and resource shortages combined with a high demand for services led health workers to adopt coping strategies that contradicted official and district regulations. Michael Lipsky described such practices as "street-level bureaucracy" (Lipsky, 1980). In line with findings from elsewhere in Tanzania (Mushi, 2009) and Zimbabwe (Mathole et al., 2004), health workers created informal attendance schedules or laboratory test schedules to reduce their work load, or continued with routines that allowed mass treatment. Health education sessions, for example, were conducted in groups and only for those women who made their first ANC visit despite the FANC guidelines requiring individual counselling at every ANC visit. The fact that not only health workers but also pregnant women accepted the attendance schedules provided evidence for the gradual internalization and socialization of these rules over time. Unfortunately, few studies have so far investigated the impact of informal practices of health workers on the quality of care and women's access to health care. With regard to IPTp especially practices of drug rationing should be further investigated.

10.3.2. The influence of community institutions
The findings of this thesis suggested that women's ANC attendance was based on norms and rituals rather than on their awareness of the benefits of ANC services for their own and their child's health. More than half of the women indicated in the exit interviews that they had attended ANC early because everyone does so, because of the nurses' advice and because they feared the consequences of non-compliance with nurses' rules. The high level of satisfaction with quality of care found reflects the women's low expectations and poor knowledge of ANC services. In fact, only one in five women was able to mention more than four ANC services. In line with studies from Tanzania (Mrisho et al., 2007, Roth Allen, 2004), Malawi (Launiala and Honkasalo, 2007) and Uganda (Amooti-Kaguna and Nuwaha, 2000, Ndyomugyenyi et al., 1998) women reported in our exploratory study that their principal reason for attending the ANC clinic was to obtain an ANC card which was perceived as a

necessary 'entry ticket' for services during delivery and illness. Visiting the ANC clinic to obtain an ANC card might thus be perceived as a social norm among women or a precautionary measure to conform to nurses' rules and to avoid harassment or informal payment requirements (Amooti-Kaguna and Nuwaha, 2000, Mushi, 2009). Mushi (2009) similarly showed that the value attached to the child's RCH card influenced mothers to take their children to the clinics and that social obligation and the ill-repute of having a sick child motivated mothers to attend clinics.

Although pregnant women's first ANC visit after the recommended four months did not prevent them from receiving IPTp, this might well have been the case for other important preventive public health tools such as insecticide treated nets or iron and folic acid prophylaxis for which effectiveness is maximized if used early (Marchant, 2002). Moreover, studies from Tanzania provided evidence that women who started ANC early and attended frequently were more likely to be assisted by a skilled attendant during delivery (Mpembeni et al., 2007, Rockers et al., 2009, Spangler and Bloom, 2010) and that this is the most effective intervention for avoiding maternal mortality from unexpected complications during delivery (Campbell and Graham, 2006). Therefore, an obvious question to ask is where interventions should aim to encourage women's early ANC attendance.

Our study showed that factors influencing the timing of ANC attendance were multifaceted and included socio-demographic, social, cultural, perceptional and service-related factors. Late timing of ANC initiation was associated with belonging to the Sukuma ethnic group, multi-parity, perceived bad quality of care and late recognition of the pregnancy. Almost a third of the women indicated that they had not recognized early that they were pregnant. Many women indicated that they had waited for the quickening before starting ANC attendance. Since several studies from southern Tanzania (Haws et al., 2010, Mushi et al., 2010) and East-Africa (Chapman, 2003, Launiala and Honkasalo, 2007) have reported the common practice of late disclosure, it can be assumed that it forms part of an institutionalized reproductive practice linked to cultural perceptions of reproductive vulnerability and witchcraft (see Chapman, 2003). Unfortunately, this study was not able to further explain women's reasons for waiting due to the limitations of the quantitative method used to investigate topics that need more in-depth inquiry and a trusting relationship with the interviewees.

Early ANC attendance was triggered by primiparity, having an experience of reproductive loss and the feeling of being supported by the partner or husband. The important role of men

for women's early ANC initiation found in this study legitimizes the Ministry of Health and Social Welfare's (MoHSW) attempts to strengthen men's involvement in maternal health issues (MoH, 2000, MoH, 2003, MoHSW, 2005, MoHSW, 2008b). When putting these political ambitions into action it is crucial to understand the context-specific barriers of male involvement in maternal health. However, despite much rhetoric about male involvement in maternal health, research is lacking on women's use of prenatal care as affected by their partners (Dudgeon and Inhorn, 2004).

Table 16: Factors enhancing and constraining male support towards pregnant women based on FGDs with men and women

Aspects of influence	Factors enhancing male support	Factors constraining male support
Gender roles	▪ Expectations of men to provide financial means for the family ▪ Transmissibility of gendered labour division during pregnancy	▪ Poverty affecting men's ability to fulfil these financial responsibilities ▪ Increasing financial self-dependence among women ▪ Societal stigma related to men's help with household work
Marriage and family	▪ Rights and obligations related to marriage ▪ Decreased involvement of the extended family in arranging marriages and supporting the couple	▪ Increased number of pregnancies out of wedlock ▪ Decreased involvement of the extended family in arranging marriages and supporting the couple
Laws and regulations	▪ Defence of women's rights by local authorities	▪ Prosecution of men impregnating schoolgirls
Health system	▪ Promotion of men's involvement in ANC services by health workers	▪ Exclusion of men from health education and other services at ANC clinics

This thesis identified several institutions at the household level and beyond with the potential to enhance or constrain men's support towards their women during pregnancy (Table 16). Our findings indicated that many institutions related to gender as well as family and kinship that enhanced men's support during pregnancy are currently subject of critical change. Globalization, development and socio-economic change have been reported as influencing the decay of "traditional" institutions and the development of new norms and values (Dilger, 1999, Silberschmidt, 2001, Tripp, 1992, Wight et al., 2006). Trends away from the extended family and towards nuclear families, for example, are not only likely to influence men's support of their pregnant partners but also to determine their access to household livelihoods.

To mobilize money, transport and people to accompany the woman to the ANC clinic might therefore become more difficult. In the interviews, men reflected the influence of "new" norms, values and regulations imposed on them by the legal system or by the "modern" health system when they reproduced "biomedical" and political expectations in accompanying women to the ANC clinic and becoming more involved in maternal health issues. On the other hand, laws created to protect women from abuse such as the Sexual Offences Special Provision Act were found to have contraindicative effects since they were reported to draw men away from their young pregnant partners.

Surprisingly and contrary to other studies, (Adekanle and Isawumi, 2008, Magadi et al., 2007, McCaw-Binns et al., 1995, McCray, 2004), adolescent pregnant women were not found to initiate ANC attendance later than adult pregnant women in this study. This is in fact a positive result since adolescent pregnant women in countries with low health indicators and poor access to health care are at a disproportionate health risk (Singh, 1998) as they are, among other factors, more susceptible to malarial infections during pregnancy (Massawe et al., 2002, Wort et al., 2006), to complications during pregnancy and childbirth (Wort et al., 2006b, Zeck et al., 2010) and also to social and economic disadvantages (Atuyambe et al., 2008). In line with the latter reports, this study identified community values and also juridical laws that constrained men's social and economic support of unmarried pregnant adolescents. Accordingly, interview partners perceived them to be more likely to be rejected by their partner or the child's father. Our quantitative analysis confirmed that adolescent pregnant women were less likely to be married. Moreover, adolescents were found to be more likely to receive advice for attending the ANC clinic from their mothers[4] than their husbands, suggesting the families' involvement in their adolescent daughters seeking of treatment. Whereas our study focused only on the timing of the first ANC visit, adolescents' overall ANC attendance might be different and needs to be further investigated. Special attention should be given to the influence of the wider social network on decision-making not only for ANC attendance but, more importantly, on the place of delivery and use of obstetric care.

The two precedent sections illustrated the broad array and the many facets of institutions existing at the national, health system and community levels that influence women's access to ANC and IPTp services. It is clear that the list of institutions discussed here is not conclusive and that different perspectives, methodologies and analyses would shed light on

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[4] From the quantitative methods it could not be concluded whether interviewees referred to their biological mother or to another women they called mother in the classificatory sense

more and different institutional arrangements. However, it attempted to show that understanding the impact of institutions as social determinants on health workers' quality of care and women's utilization of health services is essential in drawing attention to (in)efficient health regulations and guidelines at the policy level, (harmful) informal practices among health workers at the health system level and local norms and values constraining or facilitating women's access to ANC and IPTp on the household/community level and to identify adequate action to improve women's access to these services. At the same time it also highlights the fact that guidelines and other standards are – and will always be – adapted to local realities and shaped by the health workers' and patients/clients' actions.

10.3.3. Workhood

In line with other studies (Anders et al., 2008, Manongi et al., 2006, Rowe et al., 2005), this study found that besides health policy factors also health system factors such as lack of infrastructure, supplies and shortages of trained staff considerably impacted on health workers' practices and, thus, the quality of care. Daily shortages of material resources were observed in all four health facilities that served as case studies and confirmed the results of a national study on infrastructure availability in RCH clinics (Marchant et al., 2008a). The number of trained staff available at the four health facilities at the time of study was below the level required by the national staffing guideline (MoH, 1999). Due to the high level of absenteeism in the dispensaries at the time of study RCH services and deliveries (during the day and night) were handled by auxiliary nurses alone, who are the least trained of the health staff cadre, a phenomena also reported by a quality assessment study conducted by the Access Programme (personal communication: Dr. D. Mboya). A large-scale study from southern Tanzania recently quantified the critical human resource gaps that existed especially at the lowest health system level. It similarly showed that only 76% of the required nurses were employed in dispensaries and only 43% of these nurses were present on the day of the survey (Armstrong Schellenberg et al., 2008); and that health workers left at the health facilities felt overburdened, undervalued, underpaid, and isolated (Mushi, 2009).

These findings underline that structural constraints influence social processes both on the demand side, and also on the supply side. So far, reflections on access to health care have been coined from a health system perspective with little attention to the role of health workers as social actors. Despite health workers' significant role in the health care system by linking to the final consumers of health services and translating policy to practice (Kyaddondo and Whyte, 2003), there has been a surprising lack of attention to human factors such as

motivation, (Franco et al., 2002a, Mbindyo et al., 2009), trust (Gilson, 2003, Gilson et al., 2005), personal work experiences (Mathole et al., 2005, Walker and Gilson, 2004) and their impact on health sector performance. Instead, there has been a tendency of perceiving low health sector performance as a problem of human and material resource management that can be alleviated through appropriate planning and organization of health system inputs at political and administrative levels (Kyaddondo and Whyte, 2003). Also within the "Health Access Livelihood Framework" where social actors are understood as the "potential driving force for improving access to effective and affordable health care" (Obrist et al., 2007:1584) this fact has not been sufficiently reflected on the supply side.

This thesis therefore proposed the concept of workhood as a new analytical device showing that health service performance and its quality depend heavily on the availability of and health workers' access to work related resources comprising of human, physical, financial, social, cultural and symbolic capital. The availability of many of these assets has been found to be influenced by forces that go beyond the health workers' control, such as the failures of the health system, the general weak nature of the health system, politics, economics and disease dynamics. Studying health workers' basis of resources illustrated what happens to the idea of evidence-based practice when medical resources or technical competencies are not available: they become a set of improvised, untested, evidence-poor practices (Feierman, 2011). Our study showed, however, that particularly in resource-poor settings where shortages of infrastructural, organizational and staff resources were common, social, cultural and symbolic capital might become important assets to bridge structural holes and foster positive health outcomes in communities. Health workers were found to demonstrate a surprising – and so far hardly investigated – array of strategies to access resources, such as acquiring drugs when out of stock particularly through the mobilization of social relationships. Thus, the workhood concept has the potential to uncover health workers' strengths and their positive capacities to act, for example, as "boundary crossers" (Kilpatrick et al., 2009).

The revised "Health Access Framework" (see Figure 15) suggested here enhances the "Health Access Livelihood Framework" in three ways: Firstly, it provides an actors perspective on the health system; secondly, it focuses on health workers' resources and capacities (workhoods); and, finally, it gives institutions a more dominant position. Such a revised framework allows, firstly, a better understanding of how availability and access to livelihood *and* workhood resources determine utilization *and* the quality of health care.

Secondly, it draws attention to social practices regulating access to health care not only on a community level but also at the health system level.
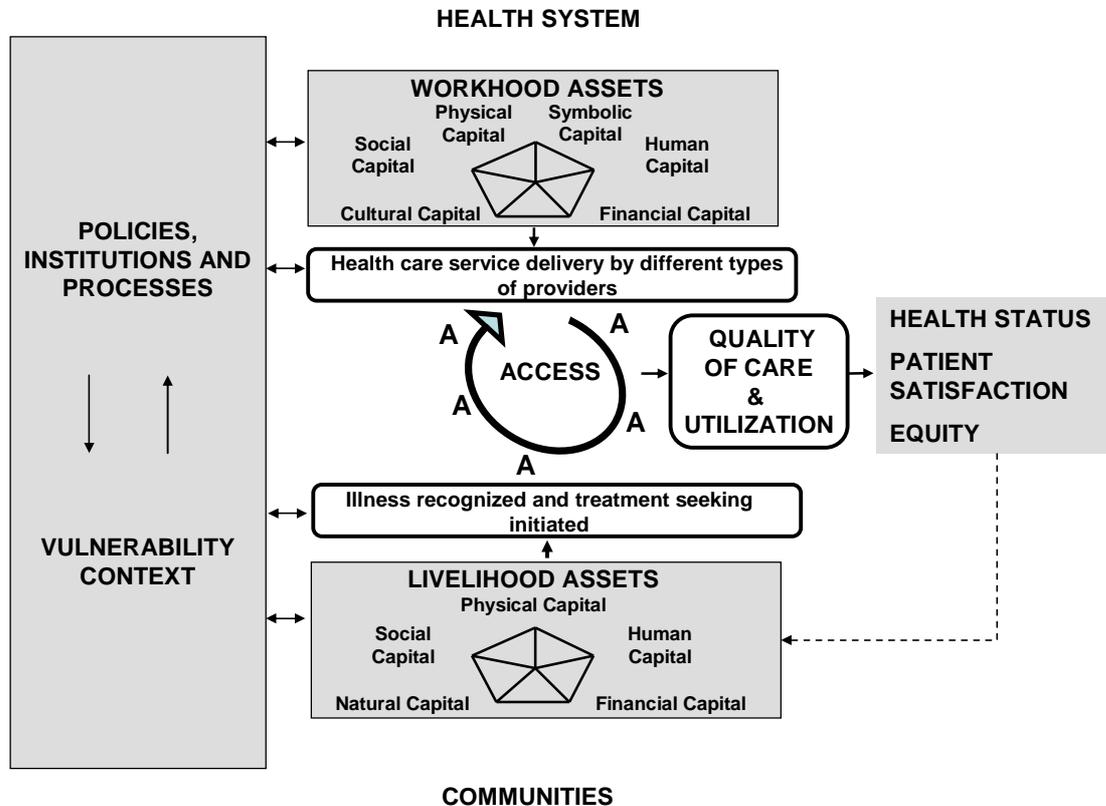
Figure 15: Health Access Framework

Adapted from the Health Access Livelihood Framework by Obrist et al. (2007)

10.4. Methodological approaches

This thesis was carried out within the DSS of the Kilombero and Ulanga district, an area where people are greatly involved in research through regular DSS visits and also in various international health research projects conducted under the direction of the Ifakara Health Institute. Conducting the study in the DSS area has several advantages (i.e. the support from local DSS fieldworkers for the selection of suitable interview partners, the availability of data, and people being accustomed to answering interview questions). On the other hand, data collected within a DSS area might not be representative of other comparable locations due to people's high exposure to health interventions and information. Treatment seeking has been reported to be higher within the Kilombero and Ulanga DSS than national levels, for example, for malaria (Alba et al., 2010a) but also for ANC utilization, which was reported to be at

almost full coverage (99.6%) for at least one ANC visit in 2008 (Spangler and Bloom, 2010) and might explain the higher coverage levels for the first IPTp dose found at ANC clinics within the DSS area compared to other areas.

This study applied a strategy of triangulation of data and perspectives in order to benefit from the specific strengths of each type of method and to investigate the aims and objectives from different angles and points of view (Flick, 2005). Fieldwork was conducted in three phases. A first exploratory phase using qualitative studies with small sample sizes informed the design of two studies in the second phase, while the third phase was used to investigate a specific question arising during the second phase. The focus was on qualitative studies, which allowed us to gain more in-depth information but, on the other hand, constrained the generalizability of the results due to small sample sizes (Mays and Pope, 1995b).

Many of the qualitative as well as quantitative studies conducted within the frame of this thesis included either individual or group interviews. Although suitable for gaining an overview of new topics within a short time, they were of limited use in investigating people's attitudes towards sensitive topics and everyday practices (Mays and Pope, 1995a). Women and men may protect their privacy or adapt their responses to what they expect the interviewers want to hear or what they would like to let them believe. Still other aspects are self-evident to the interviewees and are not consciously reflected by them. This was especially true for institutions, making it a difficult subject of research. Discrepancies between what people say and what they actually do in everyday life might therefore be considerable. Some of these limitations have been tackled through the conduct of qualitative in-depth studies or observational studies. Adolescent and adult mothers were visited several times over an extended period of time in order to establish closer relationships with them. Trust was an essential prerequisite to explore adolescents' situations and experiences with a teenage pregnancy. Moreover, observational studies at the health facilities complemented artificial interview situations. Participant and structured observation provided insights into and a feeling for health workers' daily performance, factors constraining and enabling it and into their relationships with patients. Despite the observation period of one week, it can, however, be assumed that observations were still influenced by the fact that the health workers were likely to provide better ANC services because of our presence at the health facilities, a bias often referred to as the 'Hawthorne' effect (Adair, 1984).

The fact that no observational studies were conducted at the community level to gain a deeper understanding of pregnant women's reproductive practices and experiences certainly is a weakness of this study and this is reflected in the lack of depth of the results. Such a study would have required a long-term stay in the community and the researcher's involvement in pregnant women's family lives and treatment seeking practices. Instead we tried to understand women's ANC utilization patterns and motives using the power of a large amount of quantitative data able to provide crude estimates of reality. This allowed us to compare and search for differentials between and within groups and to identify factors influencing early or late ANC attendance. As discussed above, this method was, however, not suitable for explaining certain reasons behind ANC utilization since some topics need more in-depth investigations or because women might hesitate to raise them in a structured questionnaire.

Quantitative data collection was limited by the researcher's decision to conduct a cross-sectional survey based at health facilities due to financial constraints. This form of study not only might have introduced a bias to women's responses due to the vicinity of the interview location to the health facility but also only provided partial ANC data as most women participating in the exit interviews were at the beginning or the middle of their pregnancies. Although the use of ANC card records allowed the obtaining of data on women's previous ANC visits, it still did not permit drawing conclusions on women's overall ANC attendance. Looking at timing of the first ANC visit might only tell half of the story of women's ANC utilization. Comparing prenatal care practices between pregnant adolescents and pregnant adult women the studies showed that although they started ANC around the same time, adolescent mothers were likely to attend ANC less frequently (Atuyambe et al., 2008, Magadi et al., 2007). A further limitation of the study was the fact that it was not possible to use DSS data on participants' homestead coordinates and socio-economic information because study participants could not be relocated within the DSS database.

Since all research was based on interaction with people, Swahili language skills and the thorough understanding of the local culture and the historical, political and social context was critical. Despite the possibility of mastering Swahili with the progression of research and becoming acquainted with local habits, attitudes, cultures and contexts, conducting research in a foreign language is prone to misunderstandings and misinterpretations. Exchange and discussions with supervisors, local research partners as well as the support of research assistants certainly helped to lower the level of errors.

10.5. Implications for research

Due to the exploratory character of many of the studies forming the basis of this thesis, more research is needed in order to validate and strengthen some of the findings.

Firstly, the findings of this study suggested that health workers delivered IPTp less well during the second IPTp period. Unfortunately, as with other studies (see for example Gikandi et al., 2008, Kiwuwa and Mufubenga, 2008, Sangare et al., 2010) the design of this research did not permit further investigations into the reasons behind these health worker practices. An observational follow-up study in ANC clinics is therefore needed to explain reasons behind health worker's low performance during provision of the second IPTp dose and to identify other potential harmful practices such as drug rationing that might affect the IPTp intervention negatively or even lead to increasing drug resistance.

Secondly, knowledge on overall ANC attendance of pregnant women and the influence of partners and the family on their utilization of ANC and other reproductive health care is still scarce, especially as far as adolescent pregnant women are concerned (Dudgeon and Inhorn, 2004, Ryan et al., 2009). This study provided preliminary insights about the important role they play, but further research is needed on how they can be involved to best reach women with ANC, child birth at health facilities and postnatal care (PNC).

Thirdly, semi-pastoralist Sukuma women have been found to delay ANC attendance considerably. Local research should address how to best reach these women who often live far from health facilities.

Finally, the applicability and utility of the workhood concept needs to be further investigated on a larger scale to better understand health workers' (lack of) access to work related resources, their coping strategies and the influence of health workers' social, cultural and symbolic resources on their relationships with the patients. Since there is plenty of evidence for health workers from low and middle income countries requesting informal payments from patients (Tibandebage and Mackintosh, 2005a, Kruk et al., 2008a), misappropriating drugs and other supplies (Muula and Maseko, 2006, Ferrinho et al., 2004a) and attending patients privately during official working hours (Ferrinho et al., 2004, Van Lerberghe et al., 2002), studies investigating the interference of health workers' own and their families' private

livelihood goals with their workhoods might not only provide a better understanding of health workers' reasons but also of appropriate measures to prevent such predatory practices.

10.6. Implications for policy and practice

Investigating factors influencing access to ANC and IPTp services both on the demand and the supply side, this thesis highlights the importance of combining interventions at different levels. Despite the exploratory character of some of these findings they allow the formulation of recommendations for concrete actions that are simple and make use of synergies to improve IPTp coverage, quality of ANC and ANC utilization.

Improving national IPTp coverage and delivery

➔ *Fast implementation of a simpler IPTp schedule*

Until the changing of IPTp to a new drug or an alternative intervention can take place, the IPTp schedule currently recommended by WHO should be rapidly implemented (WHO, 2004) in order to simplify IPTp provision for health workers and to increase IPTp coverage. This study showed that IPTp coverage could easily be increased by up to 20% if IPTp administration followed the revised and simplified WHO guidelines. Changing to a IPTp schedule with more frequent dosages should be considered at this point, not only because studies have shown the protective effect of more than two IPTp doses on both HIV-positive and HIV-negative women (Filler et al., 2006, Maiga et al., 2011) but also because extending to three doses of IPTp may counter the risk that women only receive one IPTp dose during pregnancy (Gill et al., 2007).

Improving quality of care at ANC clinics

➔ *Dissemination and use of an updated version of ANC card*

This study suggested that health workers complied well with the instructions of the ANC card and used them as simple and user-friendly "working guidelines". An updated version of the ANC card that includes the changed IPTp schedules as well as all other essential ANC interventions should be disseminated and used as a simple tool to improve work performance especially among untrained health workers who are unfamiliar with complex guidelines.

➔ *Training of least skilled staff*

Based on the exploratory findings of this study that health workers who are least skilled are often highly experienced and need to take over the responsibilities of their trained colleagues during absences, this study recommends not excluding them from training. To the contrary,

they should be trained, on a large scale, through up-grade courses in order to increment the availability of health professionals in Tanzania as suggested by Kurowski et al. (2007), or on a local level through rotating training schedules to mitigate the problem of insufficient resources for training as is already being practiced in the Kilombero district. This assures not only the continuous exposure of all levels of health workers to training, but also provides the least trained health workers with prospects of training and career development which has not only the potential of improving their skills but might additionally result in a positive spill-over effect of increasing motivation to work in a rural setting.

Improving ANC utilization among pregnant women
➔ *Enforce health promotion for early and frequent ANC attendance among women and men*
In order to increase the number of early ANC visits, as intended by the NMCP target (NMCP, 2007) and to improve women's knowledge about the benefits of ANC and other maternal health services and enhance their potential to actively demand these services, we agree with Campbell and Graham (2006) that information should reach women – and also men – in a variety of ways to increase the likelihood of achieving high coverage. To this end, different communication channels need to be used to reach a critical mass of women and men with information promoting ANC. This should involve the improvement of 'established' ways including the media, health education at the health facilities and at outreach posts or through individual counselling by community volunteers (Mushi et al., 2010). The important effect of men's support on women's early ANC attendance found in this study emphasizes the importance of, firstly, involving men as community volunteers as was successfully achieved in southern Tanzania (Mushi et al., 2010) and, secondly, providing them with maternal health information. The use of mobile phones might prove being a potentially cost-effect way of disseminating simple but informative health promotion messages on the importance and benefits of early and frequent ANC attendance, delivery at a health facility and PNC. Considering that mobile phone use is expanding rapidly in Tanzania and sub-Saharan Africa even in rural areas and is most popular among young people and especially young men, it might provide an excellent means of targeting the required reproductive age group and also of informing young men in particular about the health risks related to pregnancy and birth and appropriate maternal health care utilization.

In conclusion, the findings of this study underlined the influence of social and structural factors on women's access to IPTp and other ANC services both on the demand and the supply side. In order to achieve a better use and dispension of maternal health services

before, during and after birth – an essential prerequisite for reducing maternal mortality and morbidity – attention needs to be given to these factors influencing the utilization and quality of care. By looking at IPTp and ANC this thesis hoped to contribute to a better understanding of social and structural factors and of the concrete actions to address them.

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Publications

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