

2 **An Interdisciplinary Vulnerability and Resilience Approach to Health Risks in Underprivileged Urban Contexts in West Africa**

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Abstract

Vulnerability and resilience are very dynamic concepts with links to various processes. In West Africa, the vulnerability of underprivileged groups is aggravated by deficiencies in environmental and health services. Therefore, a vulnerability and resilience approach was taken as a frame of reference for a series of case studies on diseases, environment, poverty, livelihoods, and access to basic social services in urban areas in West Africa. The studies covered various aspects of exposure to different health risks: the sexual practices of schoolchildren in different urban settings in Chad; the social and sexual practices of young women in Ouagadougou in Burkina Faso; responses of women to the AIDS epidemic in Abidjan in Côte d'Ivoire; malaria in a precarious habitat in Abidjan; health problems related to urban agriculture; diseases linked to polluted water in Abidjan in Côte d'Ivoire, Rufisque in Senegal, and Nouakchott in Mauritania; and access to biomedical health care services in Nouakchott in Mauritania. These case studies show that a series of social, environmental, economic and political factors – and their interdependence – make some groups particularly vulnerable to infection; at the same time, these groups have limited options to effectively respond to health risks. In particular, social fragmentation leads to vulnerability with a multidimensional character that includes cultural, social and economic factors. Vulnerable urban populations suffer at several levels. This calls not only for research on urban environments and health issues, but also for processes that strengthen social and personal structures ('empowerment') and foster community mobilisation and social change.

Keywords: Vulnerability; resilience; health; urban contexts; West Africa.

2.1 Introduction: syndrome studies in urban contexts

Vulnerability and resilience are polysemic concepts developed in various academic fields, as well as in applied and development-related fields, by numerous authors representing different disciplines and approaches (Chambers 1989; Bohle 2001; Beck 2003). Some innovative approaches have combined perspectives on health risks in the natural sciences with perspectives on vulnerability and resilience in the social sciences. The adoption of a conceptual framework of vulnerability and resilience to urban contexts (Moser 1998; Obrist et al 2006) provides some tools for improving the effectiveness of interventions elaborated and applied in the health sphere. The interdisciplinary approaches developed in West Africa within the framework of the Swiss National Centre of Competence in Research (NCCR) North-South have helped to stimulate reflection on the concepts of vulnerability and resilience. In a larger partnership framework, groups of researchers in the region have carried out transdisciplinary consideration of these themes in different West African cities. They provide illustrations of urban centres facing environmental, demographic and socio-economic changes closely interlinked with problems of health and well-being. Studies concentrated on deprived zones in each city where several typical syndromes overlap. The density of syndromes is an important indicator for poverty and vulnerability. People living in disadvantaged urban areas are the populations most exposed to health risks.

By combining expertise from various disciplines (anthropology, geography, environmental sciences, epidemiology, public health, sociology, economy), the group of researchers represented here aimed to contribute to the production and dissemination of knowledge about the stakes of urban health while also developing new practices. The results produced by this interdisciplinary team contributed to further development of both the vulnerability and resilience concepts and tools that can be applied in health interventions. Reflection focusing on these concepts made it possible to enlarge the sphere of action for health policies by including cultural and social factors that are often neglected in analyses narrowly based on quantitative indicators of economic risk or poverty.

Inspired by different models and theories developed in other contexts, our multidisciplinary research team examined the concepts of vulnerability and resilience from the perspective of exposure to health risks in urban settlements, focusing principally on social fragmentation (HIV/AIDS, gender,

sexual and reproductive health), malaria and urban environments (livelihoods, poverty, popular practices, environmental health hazards) and access to urban services (water, sanitation, health facilities). Themes were developed as a product of joint reflection and based on a common view of examining the complex links between health problems and the increasing density of multiple syndromes in disadvantaged urban contexts. Our reflections on vulnerability and resilience to health risks helped us to understand many scientific approaches and yielded interesting results in many fields of investigation. These two concepts constitute the main theoretical focus of the various research teams. They were critically reviewed by various members of the NCCR North-South teams in West Africa. The diversity of the perspectives on which these various contributions focus confirms that vulnerability and resilience are very dynamic concepts linked to various processes. In order to analyse the potentials and the limits of these two concepts, the ideas that were derived from the different approaches are presented and commented on here.

2.2 Methods and approaches

One main focus of the studies was to analyse the links between transformations in urban contexts and their effects on health risks, taking the concepts of vulnerability and resilience as entry points. This is especially pertinent, because the themes (health risks, environmental factors, poverty, livelihoods and social fragmentation) interact at various levels. The different contributors show how these two concepts were integrated into their approaches and analyses to better understand and interpret their research results.

Scientific discourse based on the risk approach was further developed to include vulnerability and resilience. It examines how social groups and individuals exposed to risks are susceptible to vulnerability and how they react to cope with this situation and build resilience. Different authors have used various methods and approaches to define concepts and frameworks with regard to vulnerability and resilience within their own disciplines. The research reported on here draws on definitions and approaches developed by Chambers (1989), Moser (1998), Tanner and Mtasiwa (2001), Obrist and Tanner (2002), Obrist et al (2006), and Obrist (2010), considering vulnerability as a combination of exposure to risks and lack of adequate means to manage them, and resilience as the capacity to react to and manage or even prevent risks and shocks to which households, groups and communities are exposed. The concepts of vulnerability and resilience are relational and reciprocally linked (Obrist et al 2006).

Different dimensions of health and socio-economic aspects were studied in disadvantaged urban areas of Abidjan. Social fragmentation and commoditisation were addressed with an emphasis on social exclusion and access to resources among women living with HIV/AIDS in Abidjan (Kablan et al 2006), cultural and social practices in communication about sexuality between adults and adolescents exposing the latter to risk of HIV infection in N'Djamena (Nodjiadjim et al 2006), and representation of linkages between adolescents' sexual practices and HIV by their grandparents' generation in Ouagadougou (Schwartzler 2010). The two concepts were also applied in three studies involving malaria research in Abidjan, on experiences, meanings and practices in the daily lives of adults touched by the illness locally defined as *palu* (Granado et al 2006); an evaluation of the economic burden of malaria (Kouadio et al 2006); and the main problems of urban agriculture (Matthys et al 2006). Different aspects of poverty and access to resources (Bâ et al 2004) were investigated in Nouakchott. Other studies focused on health risks due to pollution of the urban environment and access to urban social services from the perspective of vulnerability and resilience, such as access to drinking water, solid waste evacuation, sanitation management, and capacity to react to crises in the urban contexts of Rufisque (Sy 2006), Abidjan (Koné et al 2006) and Nouakchott (Diop et al 2004; Koita et al 2004), and access to health facilities in Nouakchott (Keita et al 2004; Ould Taleb et al 2006).

Various sources of information, methods and analytical tools were applied and combined in our studies of vulnerability and resilience. The research approaches were both quantitative and qualitative. Quantitative information was collected in household surveys using questionnaires with various headings relating to vulnerability and resilience. Qualitative data were collected through in-depth interviews and focus group discussions, with interview guidelines targeting individuals as well as institutional, political and community actors.

2.3 Results

From a great number of rewarding contributions, it was possible to capitalise on many of the results derived from approaches using these concepts or conceptual frameworks. We decided to present only a selection of the most important ones here. The contributions in this article are organised around three orientations of the vulnerability and resilience concepts.

The first category of results shows that in urban areas, health risks are often aggravated by social fragmentation. Vulnerability associated with women infected with HIV/AIDS is translated into a break-up of social and marital ties after they share their serological status with their kin and friends and consequently experience the difficulty of finding a means of livelihood (Kablan et al 2006). Two further studies in N'Djamena and Ouagadougou showed that socio-cultural norms and values have a determining influence on the sexual practices of adolescents that put them at high risk of contracting HIV (Nodjiadjim et al 2006; Schwärzler 2010). In these three settings, these phenomena are worsened by many different factors: lack of communication, be it with HIV-positive persons or between parents and children; lack of sexual education of adolescents, who seek information among peers or in the media and succumb to peer pressure to prove sexual activity, especially when girls have sexual relationships with older men for commodities; isolation of people living with HIV; and dissociation from people thought to be contaminated. Vulnerability of HIV-infected persons or adolescents is linked with lack of education, leading to a scarceness of resources for coping with the problem. Thus social fragmentation leads to vulnerability with a multi-dimensional character, including cultural, social and economic factors.

The second category of results demonstrates that health risks are linked to poverty, livelihoods and environmental contexts. Poverty is one of the reasons for the development of urban agriculture as a source of livelihood. This environmental context is one of the driving factors in vulnerability to health risks. The results of a study conducted in Abidjan link the vulnerability of market gardeners to insecurity of land ownership and to marketing difficulties (Matthys et al 2006). Health problems are related not only to weariness and sanitation problems, but other preoccupations of daily subsistence. In analyses of malaria in precarious urban areas, a close link was found between environmental risks, which are cited as factors in urban vulnerability among other assigned causes of malaria, and the locally defined illness *palu* (Granado et al 2006). Thus, risks of malaria contamination are factors in vulnerability directly linked to the environment of a city undergoing uncontrolled urbanisation. People living in disadvantaged areas are the most exposed and the most continuously exposed to risk of malaria. Their capacity to react to this risk is associated with resilience. From the population's point of view, commoditisation opens resilience pathways, and actors can choose between different medicines to treat malaria. Commoditisation is also a major cost factor in the management of the illness. In urban areas, availability and geographical accessibility often are not a problem. Rather, vulnerability is relat-

ed to problems of equity effectiveness. On the other hand, the commoditisation of drugs offers a possibility to face urban vulnerability induced by environmental risks and to fight the illness. Observations related to the economic burden of the disease and poverty in urban households in Abidjan (Kouadio et al 2006) revealed that malaria is a very great burden for financially weak households. The economic pressure linked to this disease is even greater for people living on less than USD 1 per person per day. In this context vulnerability is a matter of the significance of economic risks linked to malaria and the fragility of the economic power and social potentialities of a household. Social capital in terms of 'belonging to social networks' is less important than expected. Vulnerability grows when people make use of different medical options without considering cost-effectiveness or co-efficacy. The impact of a disease on economic vulnerability is confirmed by an analysis of the socio-economic conditions in precarious districts of Nouakchott which indicates that more than 65% of the households are in a situation of acute vulnerability according to national poverty indicators (Bâ et al 2004).

The third category of results concerns access to urban services (water, sanitation, health) and the consequences with regard to the propagation of diseases. A study carried out in Abidjan (Koné et al 2006) on the effects of lagoon pollution on peri-urban populations living at the seashore shows aspects of vulnerability related to bad odours emanating from polluted water, to increase of bacteria, and to flies and mosquitoes as vectors of diseases such as cholera, diarrhoea, malaria, and others. Aspects of resilience are related to initiatives undertaken by individuals for maintenance of the lagoon shores and to the financial, human and social capital of households where episodes of illness occur. Other studies in Nouakchott and Rufisque on the frequency of diseases such as malaria, acute respiratory infections and diarrhoeic diseases (Koita et al 2004; Sy 2006), or on environmental risks such as lack of drinking water or absence of appropriate systems for waste removal (Diop et al 2004; Sy 2006), illustrate the consequences of vulnerability linked to health risks, lack of hygiene and environmental sanitation in urban areas. The absence of basic city services needed for urban management is an important factor in a population's vulnerability. Vulnerability grows with increasing spatial and social discrimination. The most striking example of resilience is the reactive capacity of a population leading to self-governance in sanitation. In the study areas, even in urban settings, populations still have very limited access to health facilities and basic social services. Populations in Abidjan, Nouakchott and Rufisque consider that they are exposed to numerous health risks and that they have difficulty accessing modern health care services when illness occurs. This is

aggravated by the insufficiencies of these services. The reasons put forward by inhabitants of disadvantaged urban neighbourhoods range from geographical and financial to social and cultural factors. Thus, disease episodes are managed with the support of numerous networks – be they familial, ethnic, associative or professional – which manifest through group solidarity.

The results of these studies are also interesting with regard to the numerous scientific implications of their findings, which lead to important new perspectives and lines of further inquiry and application. Only the most important studies have been chosen here to demonstrate the specificities of a given context or potentials for generalisation.

Social networks such as associations of people living with AIDS should be carefully examined in terms of benefits for the leaders and the members, and in terms of relations with the government and other non-governmental organisations and community-based organisations (Kablan et al 2006). As sexual practices are closely linked to cultural, social and religious norms and values, preventive strategies against HIV/AIDS should always be adapted to the respective context and target specific age and gender groups (Nodjiadjim et al 2006; Schwärzler 2010). Comparative studies should be conducted on associations of persons living with HIV/AIDS in other regional contexts and on associations of people with other diseases (Kablan et al 2006).

Analyses of the implications of poverty, livelihoods and environmental contexts show that urban malaria is different from rural malaria, and that urban malaria in adults differs from malaria in under-fives (Granado et al 2006). Moreover, malaria is overestimated in urban areas due to inflated perceptions. The vulnerability approach in health economics makes it possible to explain the links between economic insecurity – both resulting from and causing disease – and scarce livelihood resources (Kouadio et al 2006). New lines of inquiry for research could be multi-level analyses of home management of urban malaria, comparative studies of the local interpretation of *palu* with other interpretations of urban vulnerability (stress, nerves), or more in-depth studies on the process of appropriation in a historical perspective. Study of the social vulnerability to malaria risk would be especially important in urban contexts (Granado et al 2006). To reduce vulnerability in the economic sphere, future studies should try to develop an econometric model of the factors influencing vulnerability (risk and capability), and co-efficacy studies should identify pathways to resilience in urban settings for equity effectiveness (Kouadio et al 2006).

The studies that applied the vulnerability approach to access to social urban services illustrate that small geographic units allow for a better understanding of pathogenic systems in heterogeneous urban contexts (Koné et al 2006; Sy 2006). Also, combined approaches yield the best results for disease incidences in urban areas, and longitudinal approaches are more valid than transversal ones (Sy 2006). In disadvantaged areas, the results make it possible to gain new perspectives on the organisation of health systems (Keita et al 2004; Ould Taleb et al 2006). Future studies should investigate whether sanitation governance is the best solution to improve management practices and hygiene in urban areas (Koné et al 2006; Sy 2006). Given the wide range of water and environmental sanitation problems in urban areas, the approaches of risk perception, vulnerability and resilience can be further deepened and enriched (Sy 2006). It would be interesting to explore the reactive capacities of populations with respect to sustainability and to helping them increase effectiveness (Keita et al 2004; Ould Taleb et al 2006).

2.4 Potentials and limits of the two concepts

The concepts of vulnerability and resilience generate some focal points for scientific evaluation and political negotiation, leading to locally appropriated and adapted public health actions that are more than simple interventions because they also initiate processes of transformation (Obrist 2006). These concepts provide a framework not only for establishing values and objectives in development processes, but also for evaluating impacts and directing actions (Obrist and Wyss 2006). By using different entry points and approaches, the authors of these studies showed that vulnerability and resilience are polyvalent concepts that allow different disciplines to deal with transversal topics concerned with several aspects of urban health. Vulnerability is most often conceived as being constituted by components that include exposure to risks or perturbations and the capacity to adapt. Resilience is conceived as the ability of groups or communities to cope with external hazards as a result of social, economic and environmental change. In explaining the capacity to respond or to adapt, the different approaches show the ability of groups or communities to adjust to health risks, to moderate potential damage, to take advantage of opportunities, or to cope with negative consequences (Gallopín 2006).

The diverse orientations of these approaches and definitions, as well as the pertinence of these concepts, show the great potential they have as a basis

for pursuing interesting new topics in the field of urban health. A conceptual framework addressing questions of vulnerability and resilience from several angles allows new research questions to be generated and provides a deeper understanding of urban health problems. Based on a series of case studies in West Africa, this paper argues that new starting points and innovative concepts arise by linking vulnerability and resilience approaches, especially those focusing on access to basic services such as health, education, water, sanitation, decent habitation, and others. Urbanisation will remain a challenge in the coming years and will continue to have important implications for the health of city dwellers (Obrist et al 2006). The links between urbanisation, poverty, environment and health will continue to constitute a particular interest and a major challenge for research (Kjellstrom et al 2007).

One noteworthy limitation of the vulnerability and resilience concepts is that they are not geared to action. Moreover, regarding the nature of the approaches, vulnerability is considered as a negative property, especially in the economic, environmental and sanitary domains. In cases where change leads to a beneficial transformation, such as the emergence of a given social group, and where it becomes a window of opportunity for improvement of health systems, it is possible to speak of positive vulnerability (Gallopín 2006). With reference to the progressing epidemiological transition and the dual burden in many developing countries of both infectious and chronic diseases, it is important to direct research on urban health towards approaches that allow examination of vulnerability and resilience with a broader understanding, and that recommend concrete solutions to the problems faced by populations in their communities. Investigation of the effects of social change and transformation on health systems requires interdisciplinary collaboration among social and natural scientists and could be an appropriate item in a research agenda on syndromes of urbanisation and global change.

2.5 Conclusion

Application of the vulnerability and resilience concepts in various studies in West Africa resulted in dual enrichment, at both the conceptual and the methodological levels. The studies, which considered the two interrelated concepts of vulnerability and resilience, have made it possible to explore the risks to which populations are exposed in a more integrated way and from different angles, and to analyse the effectiveness of solutions for coping with them. The various approaches applied in our studies allow for generation

of a scientific basis to develop and validate adapted, efficient and innovative strategies in health planning and health interventions that will improve health and well-being in disadvantaged urban and peri-urban areas. The frequently very theoretical research results on vulnerability and resilience would gain importance if they could be followed by and/or linked to concrete, effective and equitable implementation dynamics.

Endnotes

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