

HEALTH IN TRANSITION – a research area bridging South African – Swedish scholars

The concept of “transition”

Global health development is facing both rapidly growing epidemics of chronic disease of the middle-aged and the unfinished agenda of infection and malnutrition mainly affecting children. Nowhere are these challenges more visible than in Africa, where the impacts of HIV and AIDS interact with this burden, resulting in an increasingly weakened generation. The combined burden of communicable, non-communicable, perinatal and maternal, mental and injury-related disorders typical of South Africa is here often labelled a multiple and polarized burden (1).

During the 20th century, Sweden, like many European countries, underwent a transition from predominantly infectious causes to non-communicable diseases, with major implications for health services, social support and longevity. This transition was partly fuelled by socio-economic development, as well as by specific medical innovations. Many of the world's poorer countries are still in the process of similar transitions, and currently at different stages. This has only been explored by researchers to a limited extent, despite the availability of long-term population statistics.

The concept of “transition” has been used to describe the above dynamics and labeled with different prefixes depending on disciplinary perspective. Transition is presumed to be fast, sometimes dramatic, irreversible and have major social, cultural and political implications.

The early concept was labeled “demographic” and it mainly involved mortality and fertility and their consequences for population changes. Thus, the ‘demographic transition’ focused on the interplay in populations between births and deaths and the consequence for the population structure. Societies were going through several ‘stages’, the first, with high mortality and high fertility characteristic of pre-industrial societies; the second with lower mortality while fertility remains high as in low-income countries, a third stage characteristic of middle-income countries where, as a result of falling fertility, population growth stabilizes and finally a fourth and final stage, characteristic of industrialized countries, where both mortality and fertility are low, population growth correspondingly low or absent, and the aging of the population marked. In this latter stage, the ratio of economically dependent persons to those of economically productive age is likely to increase.

When later using “epidemiological” as a prefix, the focus has shifted to the complex patterning of health and disease and their demographic, socio-economic and biological determinants while, during the last two decades, move to the wider framework of “health transition”, including population change, the health system as well as the epidemiological profile and the way societies respond to changing health situations as a result of cultural, social and behavioral determinants, the major drivers of population and health change in societies.

The theoretical construct of “epidemiological transition” is due to Omran (2,3) as a way of “explaining” population change, delineating the different development stages. The theoretical construct has lately been questioned for its assumptions that economic development is stage-wise and societies are subject to a natural destiny as well as measuring development by national averages and not accounting for social inequality. The transition model has also been challenged for being insufficiently epidemiological in its restricted focus on mortality at the expense of morbidity and its determinants. The epidemiological transition has fuelled discussions about how to measure population health, raising concerns over the low priority given to disease surveillance in national health systems.

Despite these criticisms, Omran’s theory of epidemiologic transition has undoubtedly contributed to global public health thinking and understanding the transition process is very important in advancing our knowledge of health problems, issues, and concerns that transcend national boundaries.

One of the greatest challenges for international public health research is the gap in health information between rich and poor countries. For one billion people living in the world's poorest countries, where the burden of disease is highest, there remains a void in vital health information. Births and deaths are often not routinely recorded and most deaths are not medically attended or certified as to cause. This constitutes a major and longstanding constraint to the articulation of effective policies and programs aimed at improving the health of the poor. The imperative for a reliable information base to support health development has never been greater. Scandinavia exemplifies the importance of health data for health policies and prevention activities as shown above.

In parallel with epidemiological transition, systems to finance and deliver health services change. The underlying forces are mainly the same – economic growth and an increasing flow of information, migration, capital etc. In sub-Saharan Africa there are very limited resources in terms of medical personnel, hospitals and drugs. A comparative analysis of health services and health systems in different countries can address many important questions of interest for countries, regardless of income level.

A major challenge for international public health research thus lies in bridging the wide gap between countries of availability of timely health information. Swedish and African researchers have been involved with the INDEPTH network (www.indepth-network.org), now encompassing more than 40 health and demographic surveillance field sites in more than 20 countries, since its foundation in 1998. This creates exciting new opportunities for sharing and exchanging health data between some of the world's poorest countries, as well as a platform for methodological development of new approaches to surveillance. The field sites form the infrastructures within which specific research projects are designed and executed. They also supply the demographic structure and sampling frame for these projects and potentially for forthcoming interventions. The demographic surveillance system sites generate high quality, population-based, health and demographic data on a longitudinal basis, and constitute a critical resource of valid, population-based information in much of the developing world. INDEPTH harnesses the collective potential of these initiatives to provide a better empirical understanding of health and social issues and to apply this understanding to alleviate the most severe health and social challenges.

The health transition in sub-Saharan Africa

Sub-Saharan Africa remains the only major area in the world where the burden of infectious disease still outweighs the burden of non-communicable disease and injuries. In a project initiated by National Academy of Sciences (4) the health transition in Sub-Saharan Africa is overviewed. Demographic and epidemiological changes, rapid urbanization, and changes in health care and nutrition have combined to produce long-term changes in patterns of health and diseases. The project's aim is to strengthen the scientific basis for policy making through evidence-based research on the continuing and evolving epidemiological transition in Sub-Saharan Africa. It will seek to relate the different Sub-Saharan African countries to different stages in the epidemiological transition of these countries, since any planning for health development must be based on a thorough understanding of the health needs of the population.

As part of this work, Defo proposed a new conceptual framework for analyzing African countries, one that he calls an "eco-epidemiologic life-course framework" for understanding the patterns of health and disease in human populations (5). Defo's analysis of 60 years of data indicates that trends in health, disease, and mortality are marked by discontinuities and abrupt changes that reflect the fragility and instability of its countries and the vulnerabilities of its individuals and populations. Specifically, the research demonstrates declines in infant mortality and increases in life expectancy—throughout the continent from the 1950s through the 1990s, a period during which communicable diseases were responsible for most deaths in Africa but growing rates of adult mortality since the 1990s, mostly ascribed to HIV/AIDS and its co-morbidities and which have played a major role in reversing the mortality trend and improvements in life expectancy, and reversing gender differences in life

expectancies in several countries because of HIV/AIDS's disproportionate impact on women. Finally, wars have played a major role in reversing the trends in under-five mortality decline in sub-Saharan countries in the 1990s and beyond, and particularly so in middle Africa and Eastern Africa.

The Health Transition in South Africa

South Africa is by no means unique among a number of transitional countries in having insufficient detailed health information for its health service planning. The absence of data on particular sections of society tends to be strongly related to socioeconomic status, with absolute poverty and "data poverty" being closely correlated. There are therefore considerable dangers that what health information there is tends to relate to people of above-average economic status, and thus can be prone to misinterpretation in terms of the overall population.

South Africa is severely affected by the HIV/AIDS pandemic, with mortality in children and younger adults increasing significantly while non-communicable diseases are becoming increasingly important causes of morbidity and mortality. However, information on these emerging conditions is incomplete and inadequate for effective health policy and planning. What are the main cardiovascular risk factors in rural South Africans? How do these differ from established risk factors based on research in industrialised settings? What are the gender differentials in risk factors, if any?

It is clear that the projections of the World Bank and WHO of NCDs being the major causes of death in the developing countries have already been met and especially so for South Africa. The challenge for the health services of a country with the multiple burden of diseases is to complete the unfinished task of managing the diseases of poverty while simultaneously initiating prevention and cost-effective care of patients with NCDs. This challenge was phrased by Beaglehole and Bonita in their text-book "Public Health at Crossroads" when recognising the Health Transition Theory as the best framework for describing changing patterns of mortality: *"Health transition research has focused largely on mortality differentials in a single society; more explanatory power would result from cross-country comparisons"* (6).

Health is increasingly recognized as a driver of economic and social development, and not merely affected by it. Despite explicit equity goals of the South African Health and Welfare Department, lack of information on the poorest sectors of the population makes appropriate planning and resource allocation to address equity gaps a major challenge.

Appendix shows three cases of PhD abstracts by South African scholars (1,7,8) that have all emerged within Sweden - South Africa institutional collaborations while also addressing the health transition in South Africa during the past twenty years.

A tentative research agenda

The future burden of NCD in Africa will probably be a major global health challenge in addition to the HIV trauma, a situation already at hand in South Africa. Decades of research have suggested how to reduce their burden, but unfortunately most information on lifestyle-related risk factors for CVD still comes from western countries. The challenge for the health services of a country with a multiple burden of diseases is to complete the unfinished task of managing the diseases of poverty while simultaneously initiating prevention and cost-effective care of patients with NCDs.

The results from the WHO study on aging using standardized data from four African and four Asian country sites show the evolution of the demographic and epidemiological transitions in low-income countries(9). It shows that people aged 50 years and over in the eight participating countries represent over 15% of the current global older population, and is projected to reach 23% by 2030. What, then, are the lessons from populations now in the late stages of health transition, with declining cardiovascular mortality, for the prevention of cardiovascular disease in transitional societies? What can be learnt from the extensive Swedish experience in this area? Will low- and middle-income

countries pass through the transitional phases experienced by the richer countries or may the early detection of the established risk factors potentially change their route? What steps should low-resource countries take (and when), in advance of the demographic, epidemiologic, and economic transitions associated with population ageing? Industrialized nations experienced population ageing after they became wealthy; most low-resource countries will have to cope with this transition prior to becoming wealthy. While the demographic changes occur over a timeline measured in decades, the development of new institutions and systems, including sound pension and insurance systems, need to be set up decades in advance of any transition.

The structure below is a tentative research agenda relating to the theme of the concept of the emerging health transition in sub-Saharan Africa and in South Africa in particular:

Health transitions do not follow the pattern observed in industrialised countries.

- What are the dynamics of demographic and epidemiological transition – mortality and fertility trends, patterns of risk and causes of death, changes in population composition and life-expectancy – within and across countries? What drives these changes, what is comparable and what is different across settings, and to what extent can future trends be predicted?
- How do these changes differ by age, sex, social group, rural and urban setting, and amongst the poorest? Are health and social inequalities between groups narrowing or widening? How do these inequalities interrelate?

The complex patterns of health transition have profound implications for the well-being of individuals and families, and poorly understood consequences for health systems.

- Who is most vulnerable or resilient? At what ages – childhood, adolescence, working-age, older people – shaped by which risk factors and social conditions?
- How can health systems, currently specialized to provide acute care, be reshaped to address the growing burden of chronic infectious and non-communicable diseases? What approaches can support the growing number of older persons?

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APPENDIX.

**Three PhD theses by South African scholars
on the health transition in South Africa**



I. **Kathleen Kahn:** *Dying to make a fresh start: Mortality and health transition in a new South Africa (2006):*

Background:

Vital registration is lacking in developing settings where health and development problems are most pressing. Policy-makers confront an “information paradox”: the critical need for information on which to base priorities and monitor progress, and the profound shortage of such information.

Aims:

To better understand the dynamics of mortality transition in rural South Africa over a decade of profound socio-political change coupled with emerging HIV/AIDS. Thereby to inform health and development programming, policy formulation, and the research agenda; and contribute to debate on the nature of the “health transition”.

Methods:

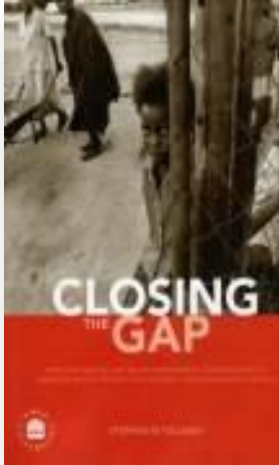
The Agincourt health and demographic surveillance system is based on continuous monitoring of the Agincourt sub-district population in rural north-east South Africa. This involves annual recording of all vital events, specifically deaths, births and migrations in 11,700 households comprising some 70,000 persons. A “verbal autopsy” is conducted on every death, and special modules provide additional data.

Findings:

A major health transition has occurred over the past decade, with marked changes in population structure and rapidly escalating mortality particularly among children and younger adults. A quadruple burden of disease is evident with persisting infectious disease and malnutrition in children, emerging non-communicable disease in the middle-aged and older, high levels of violence in an apparently peaceful community, and rapidly escalating HIV/AIDS and tuberculosis. There is evidence of sex differences and socio-economic differentials in mortality; vulnerable sub-groups include the children of Mozambican immigrants and recently returned labour migrants.

Implications:

With respect to health transition, empirical data demonstrate a marked “counter transition” with mortality increasing in children and young adults; “epidemiologic polarization” is evident with the most vulnerable experiencing a higher mortality burden; and a “protracted transition” is reflected in the co-existence of persisting infectious disease and malnutrition, emerging HIV/AIDS, and increasing chronic non-communicable disease. With respect to health policy and practice there is urgent need to: strengthen HIV/AIDS prevention, treatment and care; offer effective long-term care to control the rising burden of chronic illness and related risk; maintain and improve maternal and child health services; and address differential access to care. This poses a substantial challenge to a severely stretched health system.



II. *Stephen Tollman: Closing the gap: Applying health and socio-demographic surveillance to complex health transitions in South and sub-Saharan Africa (2008)*

Background

The challenge of research in resource-poor settings remains a profound concern and is closely linked to African social development. Work of this thesis spans the end of *apartheid* and first decade of the democratic era in South Africa, along with emergence of the HIV/AIDS pandemic. It also covers the founding decade of the INDEPTH Network.

Aims

Through appraising health and population research in a rural Southern African sub-district over the past decade, to evaluate the utility of health and socio-demographic surveillance in rural African settings for:

- capturing the dynamics of health, population and social transitions
- supporting a mix of research designs, and
- contributing to policy and programme development and evaluation.

Methods

Work was sited in the Agincourt sub-district, a heavily populated border area of rural north-eastern South Africa. Health and socio-demographic surveillance, introduced in 1992, involved prospective follow-up of the entire sub-district population of 70,000 people (including some 30% Mozambican immigrants) who lived in 11,700 households and 21 villages. Annual census rounds systematically updated household membership and recorded all vital events (births, deaths and migrations) since the previous census. A maternity history was asked of women of reproductive age and a verbal autopsy carried out on all deaths recorded. The resulting 'data and research platform' – a core feature of all INDEPTH field sites – provided data for computation of trends in vital events and supported an extensive interdisciplinary project portfolio. The population under surveillance can be disaggregated into cohorts selected by age, sex or other criteria. Analyses are possible at multiple levels (individual, family/household or neighborhood) and can include socioeconomic factors.

Findings

The Agincourt community experienced a serious worsening of mortality among most age-sex groups, rapidly declining fertility to near replacement level, and changing patterns of labour migration. This resulted in major changes in population structure and household composition. The rising burden of chronic disease involved both chronic infectious illness (HIV/AIDS and tuberculosis) and non-communicable disorders (such as stroke and related vascular disease). The burden of illness requiring chronic care increased disproportionately to that needing acute care. Potential contributions of field sites based on health and socio-demographic surveillance to local and national health policy are considerable yet remain under-exploited.

Interpretation

Rural South and southern Africa is in the midst of multiple, interrelated transitions with implications for health, social and development sectors. Health and socio-demographic surveillance systems are effective research instruments that can capture the rapidly-changing dynamics of health and social transitions in developing settings. Similarly, they can support a range of observational and intervention study designs including policy evaluations. The INDEPTH Network should boost much-needed comparative research; yet singly, and as a group, many of these sites have yet to fulfil their undoubted potential.



III. M.A. Collinson: *Striving against Adversity: the Dynamics of Migration, Health and Poverty in Rural South Africa* (2010)

Background:

The study is based in post-apartheid South Africa and looks at the health and well being of households in the rural northeast. Temporary migration remains important in South Africa because it functions as a mainstay for income and even survival of rural communities. The economic base of rural South Africans is surprisingly low because there is high inequity at a national level, within and between racial groups. There has now been a democratic system in place for 15 years and there is no longer restriction of mobility, but there remain high levels of poverty in rural areas and rising mortality rates. Migration patterns did not change after apartheid in the manner expected. We need to examine consequences of migration and learn how to offset negative impacts with targeted policies.

Aims:

To determine a relevant typology of migration in a typical rural sending community, namely the Agincourt sub-district of Mpumalanga, South Africa, and relate it to the urban transition at a national level –Paper (I) . To evaluate the dynamics of socio-economic status in this rural community and examine the relationship with migration – Paper (II). To explore, using longitudinal methods, the impact of migration on key dimensions of health, including adult and child mortality, and sexual partnerships, over a period of an emerging HIV/AIDS epidemic.

Methods:

The health and socio-demographic surveillance system (HDSS) is a large open cohort where the migration dynamics are monitored as they unfold. They are recorded as temporary or permanent migration. Settled refugees are captured using nationality on entry into the HDSS. Longitudinal methods, namely a household panel and two discrete time event history analyses, are used to examine consequences of migration.

Results:

Migration features prominently and different types have different age and sex profiles. Temporary migration impacts the most on socio-economic status (SES) and health, but permanent migration and the settlement of former refugees are also important. Remittances from migrants make a significant difference to SES. For the poorest households the key factors improving SES are government grants and female temporary migration, while for less poor it is male temporary migration and local employment. Migration has been associated with HIV. Migrants that return more frequently may be less exposed to outside partners and therefore less implicated in the HIV epidemic. There are links between migration and mortality including a higher risk of dying for returnee migrants compared to permanent residents. A mother's migration can impact on child survival after accounting for other factors. There remains a higher mortality risk for children of Mozambican former refugee parents.

Interpretation:

Migration changes the risks and resources for health with positive and negative implications. Measures such as improved transportation and roads should be seen as a positive, not a negative intervention, even though it will create more migration. Health services need to adapt to a reality of high levels of circular migration ranging from budget allocation to referral systems. Data should be enhanced at a national level by accounting for temporary migration in national censuses and surveys. At individual level we can offset negative consequences by treating migrants as persons striving against adversity, instead of unwelcome visitors in our better-off communities.