Where are the world’s disease patterns heading?
The challenges of epidemiological transition

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ABSTRACT

INTRODUCTION: Epidemiological transition theory, first postulated by Omran in 1971, provides a useful framework for understanding cause-specific mortality changes and may contribute usefully to predictions about cause-specific mortality. However, understandings of mortality transitions and associated epidemiological changes remain poorly defined for public health practitioners due to lack of evidence from low- and middle-income countries. Therefore, understanding of the concept and development of epidemiological transition theory as well as population burden of premature mortality attributable to risk factors is needed.

OBJECTIVES: This thesis aims to understand how epidemiological transition theory has been applied in different contexts, using available evidence on mortality transitions from high, middle- and low- income countries, as well as the contribution of risk factors to mortality transitions, particularly for premature mortality.

METHODS: A Medline literature search from 1971 to 2010 was conducted to synthesise published evidence on mortality transition (paper I). A descriptive analysis of trends in cause of death using INDEPTH data was conducted, focusing on specific causes of death in 12 INDEPTH sites in Africa and Asia, using the INDEPTH 2013 standard population structure for appropriate comparisons across sites (paper II). A retrospective dynamic cohort database was constructed from Swedish population registers for the age range 30-69 years during 1991-2006, to measure reductions in premature non-communicable disease mortality using a life table method (paper III). Prospective cohort data from Västerbotten Intervention Programme from 1990 to 2006 were used to measure the magnitude of premature non-communicable disease mortality reductions associated with risk factor changes for each period of time (paper IV).

FINDINGS: There were changes in emphasis in research on epidemiological transition over the four decades from 1971 to 2010, from cause of death to wide-ranging aspects of the determinants of mortality with increasing research interests in low-and middle-income countries, with some unconsidered aspects of social determinants contributing to deviations from classic theoretical pathways. Mortality rates declined in most sites, with the annual reductions in premature adult mortality varied across INDEPTH sites, Sweden, which now is at late stage of epidemiological transition stage, achieved a 25% reduction in premature mortality during 1991-2006. Overall downward trends in risk factors have helped to reduce premature mortality in the population of Västerbotten County, but some benefits were offset by other increasing risks. The largest mortality changes accrued from reductions in smoking, hypertension and hypercholesterolaemia.

CONCLUSIONS: This thesis established patterns of current epidemiological transition in high, middle-and low-income countries (Asia and Africa), where the theory fits the transition patterns in some countries, but with some needs for further adjustments in other settings, as well as deviations from the classical ET theory in the last four decades. It highlights the need to identify the burden of mortality and morbidity, particularly for reducing mortality occurring before the age of 70 years and its attribution to risk factors, which are a major public health challenge. This informs shifting of public health priorities and resources towards prevention and control of chronic non-communicable disease risk factors.

KEYWORDS: epidemiological transition; premature mortality; non-communicable disease; risk factors; Sweden; low-and middle-income countries; INDEPTH Network; Västerbotten Intervention Programme.