Analysing the link between noncommunicable diseases and happiness: evidence, policy and lessons from Bhutan.

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Abstract

Background
Noncommunicable diseases (NCDs), such as cardiovascular diseases, cancer, diabetes and chronic respiratory diseases, are the leading global causes of death, they are responsible for 70% of deaths worldwide (World Health Organization, 2017b). In 2015, almost three quarters of all NCD deaths (30.7 million) occurred in low-and middle-income countries. (World Health Organization, 2018a) To strengthen national efforts to address the burden of NCDs, the 66th World Health Assembly endorsed the ‘Global Action Plan for the Prevention and Control of Noncommunicable Diseases 2013-2020’ (hereafter referred as the global NCD action plan). The global NCD action plan provides Member States with a road map and menu of policy options which, when implemented, will achieve 9 global NCD targets, including a 25% relative reduction in premature mortality from NCDs by 2025 (World Health Organization, 2013).

Progress in the prevention and control of NCDs is uneven and insufficient. (World Health Organization, 2017b) Factors impeding the implementation of global NCD action plan spans from lack of political commitment and leadership to unmet needs and demands for technical assistance, and to inadequate fund and limited progress in engaging non-health sectors. (Alwan, 2017) This underscores the need and challenges for countries to scale up actions for prevention and control of NCDs. Responding to these NCD challenges, Bhutan Government developed the “Multisectoral national action plan for the prevention and control of NCDs, 2015-2020” (hereafter referred as the national NCD action plan) and the Council of Cabinet Ministers endorsed this plan in 2015.
The main aims of my thesis are to generate evidence to support NCDs as a policy priority and to provide action oriented recommendations to strengthen prevention and control of NCDs through strategic engagement with Gross National Happiness (GNH).

**Methods**

This research used mixed methods, incorporating both quantitative and policy analysis methods. For the quantitative component, we analysed three national level data sets. First, we availed the 2014 national NCD STEPS data from the Ministry of Health, Bhutan. Second, we availed the 2010 and 2015 national data on Gross National Happiness. The logistic regression analysis (Paper 1 and Paper 3) and General Estimate Equation (Paper 2) were used. The statistical analyses were carried out using STATA (Paper 1 and Paper 2) and SAS (Paper 3). For the policy analyses, an extensive literature review was conducted on health and happiness (Paper 4, Paper 6 and Paper 7). Then we analysed Bhutan’s GNH Index in conjunction with the global NCD prevention and control objectives to identify strategic policy opportunities where action on NCDs could be improved through engagement with GNH. In a stepwise process, we firstly established the linkage between GNH determinants and the health (Paper 5). In the second step we identified the shared agendas, determinants and specific policy questions that can integrate the NCD policy priorities into relevant policies across sectors (Paper 6).

**Results**

The subject of well-being and happiness has gained political momentum and the attention of political leaders. In addition health is the single most important determinant of wellbeing and an adverse health conditions have lasting and negative effect on well-being (Paper 4).

Analysis of the 2014 national NCD STEPS data found that the prevalence of modifiable risk factors of NCDs namely; tobacco use, harmful use of alcohol and low fruits and vegetables intakes were 24.8% (95% CI: 21.5, 28.5), 42.4% (95% CI: 39.4, 45.5) and 66.9% (95%CI:
61.5, 71.8), respectively. Similarly, the prevalence of metabolic risk factors like overweight, hypertension and diabetes were also very high, 32.9% (95% CI: 30.0, 36.0), 35.7% (95% CI: 32.8, 38.7) and 6.4% (95% CI: 5.1, 7.9), respectively (Paper 1). At the same time, the least often studied form of NCDs, the common mental disorders, was highly prevalent in Bhutan (Paper 2).

Admittedly, we also found that socioeconomic factors were significantly associated with overweight/obesity, hypertension, diabetes, symptoms of common mental disorders and the sleep duration (Paper 1, 2 and 3). For example, we observed that older age groups and tobacco users are more likely to be overweight, hypertensive and diabetic. Likewise, our analysis (Paper 2) confirmed the importance of established socio-economic risk factors for Common Mental Disorder (CMD), and suggested a potential link between spiritualism and mental health.

Further, our in-depth analysis of GNH and global NCD action plan (Paper 6) identified five shared agendas between prevention and control of NCDs and GNH. They are 1) prevention of premature deaths and disability due to NCDs 2) strengthening leadership and governance for policy prioritization 3) mainstreaming social determinants of health in all relevant policies 4) strengthen research and development and 5) monitoring the policy impact on health and GNH determinants. These shared agendas can be integrated into policies across relevant sectors by asking specific policy questions on shared GNH determinants namely, health, education, decision making opportunities, engagement in productive activities, economic security, time use and balance, material well-being, social support, equity and transparency (Paper 5 and 6).

Analysis of the linkage between health domain and GNH determinants demonstrated that policy impact on GNH determinants can adversely affect health (Paper 5).

Conclusions
The research conducted in this thesis contributes to measuring NCDs as a major public health problem in Bhutan; highlights that the prevention and control of NCDs can be addressed as a whole-of-government approach by identifying shared agendas and determinants between the NCDs and Gross National Happiness (Paper 7).