

Problems with the epidemiologic transition model: structural inequality, *H. pylori* bacteria and stomach diseases in Aklavik, NWT

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Background

The epidemiologic transition model (ETM), introduced by Omran in 1971 (1), provides an eloquent theory linking shifting economies in societies to changing population patterns in life expectancy and all-cause mortality. Omran posits that the adoption of agriculture introduced Neolithic societies to an “Age of Pestilence and Famine” and that in the 20th century we began to see a shift from infectious diseases to an “Age of Degenerative and Man-Made Diseases” (also called “Diseases of Affluence”, i.e. chronic diseases) in technologically and economically developed first-world nations. While the basic premise makes sense – that socio-economic and technological changes over time lead to changes in population disease patterns – the discriminatory and inherently colonial connotations of Omran’s thesis should not be ignored, especially as this model has been used in public health as a platform for advocating certain health policies in developing nations and among the disadvantaged segments of developed nations. Several scholars have criticized the ETM for assuming human societies pass through distinct stages of development with each new stage being more desirable than the previous; ignoring the epidemiologic and social variation within nations; and obscuring the fact that “diseases of affluence” disproportionately affect the marginalized and the poor. However, the ETM, and more generally a paradigm of “transition”-based thinking, continues to be quite common in research in the circumpolar North. We see this in studies of northern populations that focus on “social transition”, “nutritional transition” and “cultural transition”.

Much of the literature focused on “transition” in the North appears to imply that technological and industrial development should automatically lead to decreased infectious diseases through increasing access to biomedicine, and subsequently lead to increased chronic diseases as Arctic populations “adapt” to Western diets and

sedentary lifestyles. The notion of “transition” itself can be problematic, as it implies that the Indigenous peoples are caught in the past and need to “catch up” with the white society. Some have argued that transition models do not adequately reflect the lived experiences of the northern Indigenous populations (2). These populations cannot be said to be undergoing simple socio-economic transitions with clearly demarcated periods of “traditional” and “modern” technologies and economies.

Case study

Epidemiologic and ethnographic data from the Aklavik *H. pylori* Project (AHPP) can be used as a case study to reveal problems in the ETM. *H. pylori* infection is chosen because its well-documented association with stomach cancer challenges the tendency to view infectious and chronic diseases as separate phenomena and because *H. pylori* infection the world over is strongly associated with social inequities. I joined the team as a medical anthropologist in 2011 to research *H. pylori* incidence and re-infection following the project’s treatment trial and to provide an ethnographic exploration of risk factors identified through earlier epidemiologic research.

Aklavik is a remote Arctic community of approximately 625 people who are predominately Indigenous (approximately 60% Inuit, 32% First Nations, 1% Métis and 7% non-aboriginal). The AHPP is a community-driven project that investigates the high prevalence of *H. pylori* infection and associated diseases, including stomach cancer, in the community. Initial project research revealed an infection prevalence of 58% (3), while stomach cancer accounts for 25% of all cancer deaths between 2002 and 2011. At least 2 recent cases of stomach cancer have been conclusively linked to *H. pylori* infection. Descriptive epidemiology indicates that the major risk factors for the infection in this community are low annual income, household crowding and bed sharing, and Indigenous ethnicity.

Discussion

There are several reasons why *H. pylori* infection and stomach cancer should not be explained using a transition-based model. Ideas of “transition” often assume that Indigenous peoples are assimilating into the dominant culture and socio-economic context. While it is true that the more economically prosperous families in Aklavik display fewer *H. pylori* infections, it is wrong to assume that they represent more assimilated (i.e. less “Indigenous” or less “traditional”) segments of the community. Rather, my ethnographic research shows that the more economically well-off families in Aklavik have better access to *both* Western and traditional Indigenous resources and ways of living. Although residents have “transitioned” to living permanently in a settlement, my analysis of household composition and genealogies shows that Aklavik’s Indigenous families are organized into larger extended kin networks, in which a single household often benefits from the contributions of kin from several households. Consequently, it is inappropriate to use the household – a classic unit of epidemiological analysis – as the focus for understanding the distribution of *H. pylori* in Aklavik. “Indigenous ethnicity”, “low income” and “household membership” are not discreet risk factors but belong to a constellation of social realities produced by historical interactions between local Indigenous peoples and non-Indigenous Canadians.

The epidemiological picture is complicated by the fact that medical scientists do not know definitively how *H. pylori* infection is transmitted or whether prevalence in Aklavik prior to the 2008 treatment trial differs drastically from prevalence over the span of the 20th century. We do know that cancer in general is on the rise, and that stomach cancer rates seem abnormally high. Thus, it appears that the rise of chronic disease in Aklavik is not

entirely the result of receding infectious disease nor can the burden of *H. pylori* infection be explained adequately through a transition-based theoretical model. Alternatively, an *ethnographic* epidemiology explains how Aklavik families navigate Indigenous and Western cultural values while maintaining traditional family organization and responding to modern socio-economic challenges, which in turn influences their exposures to risk factors, such as housing quality, crowding and bed sharing.

Conclusion

Ethnography in this case study serves multiple purposes: (a) as a way to augment and enrich the descriptive epidemiology of infection and identified risk factors; (b) to reflect on how scientific theoretical models reflect Western cultural biases; (c) to assess how such models may be conflating, obscuring or neglecting important factors contributing to the higher burden of *H. pylori* infection among marginalized and poor individuals and families (such as the contemporary impact of colonialism); and (d) to augment epidemiologic data collection and stratification in the AHPP.

References

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