Canadian Milestones in Population and Public Health Research

In March 2010, the Canadian Institutes of Health Research – Institute of Population and Public Health (CIHR-IPPH) in partnership with the Canadian Public Health Association (CPHA) initiated a call for milestones in population and public health research that have significantly contributed to the public's health in Canada and globally. This initiative complements CPHA's efforts to identify 12 public health achievements. These activities and others commemorate the 100th anniversary of CPHA by celebrating the contributions of public health from a Canadian perspective and making our public health history more visible. For more information, please see the CPHA Centenary website at <http://cpha100.ca>.

These four milestones in population and public health research, selected through a competitive peer-review process, have made significant advancements to the field of population health and our collective understanding of health equity. The milestones demonstrate the extraordinary contribution that population and public health research has made to public health practice. In Canada, we are truly fortunate to have such dedicated and talented researchers working in the name of population and public health; we know that Canadians enjoy the benefits of their research every day.

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Why Are Some Books Important (and Others Not)?

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ABSTRACT

The book *Why Are Some People Healthy and Others Not? The Determinants of Health of Populations* represented a milestone in our evolving understanding of the determinants of population health. Building on Marc Lalonde's earlier *A New Perspective on the Health of Canadians*, it created a theoretical framework that could incorporate emerging evidence from a wide range of disciplines. Central to its authors' approach was the observation of *heterogeneity*, of the systematic differences in health observed when populations are partitioned on characteristics such as income, education, geographic region, etc.

The universal observation of a social gradient, of a strong correlation between socio-economic class and health, led to a focus on how the social environment might influence health. Social position strongly influences both the stresses to which individuals are subject, and the resources available to cope with them. Furthermore, healthy and unhealthy responses to stress become "embedded", learned or conditioned both behaviourally and biologically, thus influencing health over the whole life course.

The book's impact has been remarkable, not merely in academic citations but through its authors' subsequent work and strategic positions in Canadian health research organizations. The concept of "Population Health" has become part of our shared intellectual heritage.

Key words: Population health; social determinants of health

La traduction du résumé se trouve à la fin de l'article.

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Why are some people healthy and others not? This deceptively simple question has many and complex answers. The book of this title, published in 1994, represented a milestone in the understanding of the determinants of population health. It synthesized and focused knowledge of these determinants, pointed towards and stimulated fruitful lines of research, and suggested directions for public policies that could significantly improve the health of Canadians. Its chapters emphasized the growing evidence that the socio-economic context in which individuals live and work both influences their health directly, and lies "upstream" from other behavioural and biological factors that influence health status over the life course. The book's impact can be found today in training and research programs, in research funding priorities, in new data resources, and in the organizational structures of institutions responsible for public health policy, in Canada and beyond.

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The Milestone

*Why Are Some People Healthy and Others Not?*¹ was a significant milestone on a long road that stretches both behind and ahead. Marc Lalonde's *A New Perspective on the Health of Canadians*,² twenty years earlier, provided the foundation on which our theoretical framework was built. Its categorization of the determinants of health (the Four Fields) was expanded and interlinked to incorporate the growing array of subsequent research evidence. (This expanded framework has been republished a number of times.) Earlier work by Thomas McKeown and the prior and contemporaneous research of Michael Marmot, Richard Wilkinson and Robert Sapolsky, among others, strongly influenced the development of our thinking.

"Heterogeneity," notes Robert Sapolsky, "is a wedge for understanding." Systematic variations in health are observed whenever populations are partitioned on the basis of characteristics such as income, education, geographic region, or ethnicity. The fundamental theme of the book, and the associated research program, was that these variations point to a broader set of important health determinants than were typically considered at the time.

Some determinants of ill-health are obvious – poverty and material deprivation, polluted environments, inadequate medical care, or so-called "unhealthy lifestyle choices" such as smoking or obesity. But the consistent observation of a strong social gradient – the higher the healthier – undermines simple explanations. Smoking and obesity are certainly unhealthy. But they are also socially graded, concentrated among lower socio-economic groups. Aspects or at least correlates of social position strongly influence the prevalence of these "lifestyle choices". Material deprivation and inadequate medical care are likewise threats to health. But a health gradient is found all the way up the socio-economic scale, not just at the bottom, and is found in countries with modern, universally accessible health care. Something else is at work.

Social context influences the levels of physical or emotional stress to which people are routinely subjected; it also conditions their responses. Stress of various forms is part of the human condition; the healthy organism is resilient, mobilizing effective coping strategies. Money, knowledge and social support are highly effective "tools" for coping with many sources of stress; without them, people are physically and emotionally more vulnerable.

Perhaps even more important are the biological and behavioural responses to stress. The socio-economic context not only promotes and conditions healthy or unhealthy behaviours, it becomes biologically embedded in differing physiological responses, literally getting "under the skin". These differences, powerfully influencing the health trajectory over the life course, are also graded by social class.

Legacies and influences

A count of citations in related academic journals found nearly twice as many as the next-highest of five selected comparator volumes.³ Citations are, however, a very limited measure of impact.

Research Programs

Recent advances in neuroscience are revealing how the brain reconfigures itself in response to environmental stimuli. In genetics, it is now understood that the expression of a particular gene may depend upon the environment experienced by the organism, including the social environment. Research is now showing *how* social context becomes biologically embedded. The CIFAR Program

in Experience-Based Brain and Biological Development, a direct descendant from the book, is a leading participant.

This research also highlights the importance of early child development, when the brain is most plastic and the genes are being expressed (or not) (e.g., refs. 4, 5). The consequences of unhealthy early-year rearing environments show up over the whole life course, first as unreadiness to learn, then poor school performance, higher crime rates, weak labour force attachment and lower productivity, and finally poorer health in later age and earlier death. Dan Offord's work leading to the Early Development Index, implemented across Canada and Australia, and the focus on early childhood education emerging in BC, Quebec and Ontario reflect the impact of the book.

The influence of social context continues in adulthood. Another CIFAR "daughter program", Successful Societies, asks "What kinds of societies seem on average to produce the healthiest, happiest, and most productive populations, and why?" The criteria for success are many and varied. Nonetheless, some systems of social, political and economic organization clearly work better than others. (The dramatic mortality differences between former Soviet and "Western" societies offer a grim demonstration.)

Workplaces in particular can differ greatly, not only in exposure to accidents or toxins, but also in less tangible forms such as rigidity of hierarchy and locus of control, with corresponding effects on health. The foundation of the Institute for Work and Health in Toronto is a direct consequence of the findings assembled in *Why Are Some People Healthy ... ?*;¹ the Institute now plays a major role in advancing research in this area.

Data Resources

Serious concern with the longitudinal and multifactorial determinants of health places severe demands upon the data systems necessary to support research and guide policy. Another stream of activity originating from the book has been the development of much more extensive datasets to investigate these determinants. One of the book's chapters provides a detailed and comprehensive description of the data required for this purpose. Statistics Canada and several provinces (most notably Ontario, Manitoba and BC) have since made great strides in building or expanding such data systems along with mechanisms for facilitating access for research and supporting hundreds of related publications.

Research Funding, Centres of Excellence, and Capacity Development

One measure of the book's impact is through the subsequent careers and influence of its authors. Jonathan Lomas, who christened the book and later the "Four Pillars" of health research, was the founding Executive Director of the Canadian Health Services Research Foundation. Michael Wolfson has served as Assistant Chief Statistician of Canada, during which time investments in health data increased tenfold; he now holds the Canada Research Chair in Population Health Modeling/Populomics at the University of Ottawa. Marc Renaud served for a number of years as President of the Social Sciences and Humanities Research Council of Canada. He and Noralou Roos, executive members of the Interim Governing Council of the CIHR, embedded the book's new framework for understanding health in the new Institutes' commitment to the Four Pillars. John Frank and Morris Barer then became the founding Directors, respectively, of the CIHR Institutes of Population and

Public Health and of Health Services and Policy Research. Cameron Mustard, though not a book author, has taken forward understanding of its concepts and evidence first as Chief Scientist and then as CEO of the Institute for Work and Health. Program “alumni” have also played leading roles in Canada’s top health services and policy research centres, at UBC, Manitoba, McMaster, and the University of Montréal, and in the evolution of new training/education programs. All have been shaped through the creation of the book, a milestone in our lives.

Intellectual and Policy Penetration

The subsequent placement and influence of the book’s authors, as well as their later research, have greatly expanded the impact of the book itself. “Population Health” was an unfamiliar term when first coined by Fraser Mustard; the book institutionalized the concept. It is now common parlance, part of the shared intellectual heritage of students of health in Canada and beyond (e.g., ref. 6). Courses are given in Population Health; research granting agencies support studies in the subject; schools (as at UBC) and institutes (such as IPPH) are now named “Population and Public Health”, and scholars debate the relationship between the two labels. The concepts of population health and its determinants have penetrated deeply into federal and provincial bureaucracies concerned directly or indirectly with health.⁷

The fundamental importance of early child development is likewise now broadly accepted, both through subsequent research in biology and through studies of education, labour force participation, crime and other social issues. Hertzman and others are moving the implications of the book into “action research,” working with teachers, social workers, the police and other community leaders. The resulting social mobilization came only one election short of establishing a national program for early child development in Canada.

CONCLUSION

*Why Are Some People Healthy and Others Not?*¹ is now a firmly embedded milestone in the intellectual landscape of health. The above is only a space-constrained selection of its identifiable consequences. The totality of effects, past and continuing, is far greater.

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RÉSUMÉ

Le livre *Why Are Some People Healthy and Others Not? The Determinants of Health of Populations* [en version française, *Être ou ne pas être en bonne santé : Biologie et déterminants sociaux de la maladie*] représente un jalon dans notre compréhension graduelle des déterminants de la santé des populations. Inspiré du rapport de Marc Lalonde, *Nouvelle perspective de la santé des Canadiens*, ce livre a créé un cadre théorique qui a su intégrer les preuves émergentes d’un vaste éventail de disciplines. L’approche des auteurs s’articulait autour de leur observation de l’hétérogénéité : des écarts systématiques dans la santé observés quand les populations sont segmentées selon des caractéristiques comme le revenu, l’instruction, la région géographique, etc.

L’observation universelle d’un gradient social, d’une corrélation solide entre le statut socioéconomique et la santé, a permis de percevoir comment l’environnement social pouvait influencer la santé. La position sociale influence beaucoup les agents stressants auxquels les gens sont confrontés et les ressources à leur disposition pour composer avec ce stress. De plus, les réponses au stress, saines ou malsaines, deviennent « ancrées », apprises ou conditionnées, dans les comportements et sur le plan biologique, et elles influencent la santé pendant toute la vie.

Ce livre a eu un énorme retentissement, non seulement auprès des chercheurs qui l’ont cité, mais par les travaux ultérieurs de ses auteurs et leurs postes stratégiques dans des organismes canadiens de recherche en santé. La notion de « santé des populations » fait aujourd’hui partie de notre patrimoine intellectuel commun.

Mots clés : santé des populations; déterminants sociaux de la santé