

What is population health?

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September 12, 2007

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There have been dramatic increases in life expectancy in the 20th century. Improvements in medical care have played a major part.¹ But a large role has also been attributed to developments outside of the health sector - better food, housing, education, and employment opportunities.² Some of these advances have been 'health motivated,' such as reductions in road deaths due the introduction of seat belt legislation and improvements in the quality of the water supply. Others have been 'health by products' of choices made for other reasons, such as better educational opportunities for girls and the reduction of air pollution by reductions in coal burning. Overall it means that sources of improvement in health have been wide ranging and are likely to continue to be so.

Health Canada describes population health as:

an approach to health that aims to improve the health of the entire population and to reduce health inequities among population groups. In order to reach these objectives, it looks at and acts upon the broad range of factors and conditions that have a strong influence on our health.³

Core sciences in population health

Epidemiology is a core science in population health. Epidemiologists examine the pattern of diseases in populations to determine factors in disease causation. All of the accepted 'lifestyle' risk factors such as smoking, alcohol intake, fat intake, and exercise were identified in epidemiological studies of populations. Examples are cohort studies, which involve following a healthy population over time and seeing if deaths are associated with patterns of behaviour or environmental exposures. Case control studies involve finding lots of people with the disease in question and then finding others who don't have the disease and comparing information, say on lifestyle, family history or chemical exposures in the environment. It is almost impossible for a doctor to determine exactly what caused a disease in any individual patient. But when it comes to populations, we know enough about the influence of various risk factors on health to predict the death rate from a handful of key factors. Age, gender and socioeconomic status explain most variation in disease rate.⁴ Beyond this much can be explained by smoking, diet, exercise, obesity and unsafe sexual



practices. A sense of personal coherence, mental well-being and connection to others has also been shown to be critical for health.⁵

As we try to understand what causes people to smoke, drink or become alienated from their community, or to put it positively, what causes people to be connected, resilient and caring for their well being, some other core sciences have brought additional insights and alternative perspectives in population health. These are *psychology, sociology, education, political science, geography, ecology, anthropology* and *economics*.

More is different

Some of the above mentioned disciplines bring unique perspectives because their core interest is social phenomena. “Social” means in relation to others. As soon as we start thinking about people in relation to others we are thinking about health causation factors that only exist at the level of the population.

“More is different,” so claimed Nobel laureate in physics, Phillip Anderson, in his famous 1972 paper.⁶ Anderson was talking about the way physics had been (pre)occupied with describing and classifying fundamental particles and in trying to account for individual actions and interactions up to the scale of atoms. But, he argued, if you throw a group of atoms together, things become quite different. That is why chemistry became a science of its own and not simply a branch of physics.⁷

So too do the insights that we have about people, and their health, become different when we take a population perspective. Put people together and things happen. Research questions about *population phenomena* look at things like distribution, hierarchy, stratification, and interaction. Person-to-person transmission in infectious disease is the obvious case of a population phenomenon. But there are more subtle ways in which people affect each other’s health. People who have a stronger attachment to their community as measured by a simple questionnaire have better health.⁸ Low income people who live in neighbourhoods where most others are better off than themselves are healthier possibly because their middle class and rich neighbours demand better local services.⁹ So the quality of the schools, the retail outlets, the parks and roads is better and everyone benefits from that. In Alberta even survival after a stroke is related to the neighbourhood people live in, independent of one’s own social economic status.¹⁰ Community matters. As the population health program of the Canadian Institutes of Advance Research taught us, social determinants explain a lot of the reasons why rates of disease are higher in some populations than others.⁴

The key point is that processes at the population level can and do manifest themselves in individuals. The “social gets under the skin”¹¹ and translates to physiological phenomena in the sympathetic nervous system, the immune system and beyond. We knew at least thirty years ago that a person’s physiological response to stress induced in a laboratory situation is modified by the perceived control that they feel they have over the stressor.¹² So when Michael Marmot in a large cohort study of thousands of British civil servants subsequently showed that position in the social hierarchy at work has a direct effect on mortality¹³ the explanation was in a sense already there. What’s more exciting now is the possibility for prevention.



Promoting Health at a Population Level

Broadly speaking there are two pathways to pursue when it comes to efforts to prevent disease and promote health.

First, doctors and other clinical practitioners can do things with the patients they see. Some of this takes the form of preventive advice and lifestyle counseling. We are now better at understanding what is effective and what is not effective in this domain, and there are some promising best practices.¹⁴ Pharmaceutical companies are increasing the options doctors have for prescribing “preventive” drugs for people who aren’t sick but might be at risk of illness. This is the outcome of the type of research that comes from studying the physiological processes. Prescribing medications to “pre clinical” people is a booming new “market” as evidenced by the excitement of investors on Wall Street in biotech companies.¹⁵ But there is a downside to this strategy. It is costly. In Canada more and more people are taking prescription medications. Rising pharmaceutical costs are the biggest factor driving increases in total health spending.¹⁶ So while it makes investors happy, the strategy of seeking pharmaceutical solutions to prevent or allay common problems is draining our capacity to deal with real, acute care needs. People would most likely also object to mass medication on other grounds.

The second pathway to improving health is more upstream. It’s about promoting health at the population level by designing preventive interventions that get to bigger groups of people more effectively and efficiently than any practitioner could working at the one-to-one level. Examples here are *policies* like taxes on tobacco, which achieve reductions in tobacco consumption; *programs* in schools to reduce substance abuse and alcohol intake and also programs in child care agencies to enrich children’s early experiences in play, language and social development; and mass *media and social marketing campaigns* that have been successful in diverse domains from cancer control, to mental health, to back pain control.

There is lot to boast about when it comes to achievements such as these in population health. Smoking rates, which used to be as high as 80% in the 1950s, are now around 25% in many western countries.¹⁷ Many of the common infectious diseases of childhood have been largely reduced by vaccination.¹⁸ Neural tube defects in babies have been rendered rare by the addition of folate into food.¹⁹ Dental caries have been reduced drastically by the addition of fluoride into the water supply.²⁰ Motor vehicle deaths have been halved in countries where there is seat belt legislation, restrictions on the use of hand held mobile phones in cars, and active enforcement of laws on blood alcohol levels when driving.²¹ In the last 10 years we have seen a 50% reduction in sudden infant death syndrome because of a campaign to change the position young babies are placed in when they are put down to sleep.²² In Poland, there was a 20% decrease in deaths from cardiovascular disease when pricing policies reduced the cost of fruit and vegetables relative to meat and dairy products.^{23,24} In Australia, which has had intensive campaigns and policies in sun protection for many years, skin cancer rates are going down.²⁵ By contrast in Canada, which is less concerned with sun protection, there has been a 30% increase in skin cancer rates in the last 10 years. Currently 3,900 Canadians are diagnosed with melanoma each year and 840 die from it.²⁶



We are talking here about the science and practice of population level health promotion.²⁷ The essence of it is strategies that don't rely on identifying and 'treating' particular individuals. Indeed it's often called *the science and practice of helping people we never meet*. But that has a downside as well. People you have never met never know what you are doing, let alone thank you for it. People generally don't "see" population health interventions. They don't see the scientists and practitioners behind the scenes. By having population level health promotion as the proposed focus of our Centre, we want to increase *the quality of the science, the quality of the practice and increase its visibility*. We can't afford to continue to take good health for granted.

The Special Nature of Intervention Research

It is not easy to get things right when it comes to health promotion interventions. There have been some huge expensive failures in persuading people to change their health behaviour and alter their lifestyles.^{28,29} Some work on the social development front has also been disappointing. In the UK, the £30b Sure Start program, a program to improve developmental outcomes of children in disadvantaged areas, actually seems to have made things worse for many of the most vulnerable families.³⁰

What have we learned? First, we learned that effective interventions have to focus on *multiple levels* people and the array of environments in which they live, work and play. It's no good just educating or reminding people to change their food choices if fresh food choices are not available at work or at school or nearby where people live. It is easier to quit smoking if there are smoking regulations in your workplace that make you have to practice going without cigarettes. We have learned that media campaigns to tell people about health risks need to be backed up with programs to get general practitioners to be better skilled at talking to people about lifestyle change. Working at multiple levels, the individual, the family, the workplace, school and the community is what seems to work best. Second, we have learned that many interventions fail for reasons like not getting the science right when it comes to motivational processes of individuals making behaviour changes or organisations making policy changes. Third, it is hard to reach the right people the first time a program is delivered, so it has to be tried and retried to make sure it reaches those most in need. Fourth, many programs fail simply because they are poorly implemented. Sometimes the problem is with the staff, who might themselves be stressed and half hearted about their roles. Finally, a program may not be sufficiently well resourced.

The point is that getting the right interventions in place to bring about changes in the risk of whole populations is complicated. It's a science and practice of its own.³¹

A Focus on Settings

The common conceptual focus of much of the Centre's is the *setting*. Although population health is about helping people we never meet, we do know where people live, work and play. So interventions can be targeted at settings like schools, worksites and whole communities.³²



This type of health promotion was first brought to prominence by the World Health Organisation in 1991.³³ But this type of approach is not simply about taking advantage of “captive audiences” and jamming them with health messages.

A more sophisticated approach recognizes that places like schools and workplaces have their own psychology, sociology and ecology.³⁴⁻³⁶ This creates a science for analysis and intervention that focuses on people-environment interaction. People think and act differently when they are with other people in settings, and properties of these settings can be harnessed for health and well being. Obvious things have been mentioned previously, like the price of the food or whether there is a place to take a shower after a run at lunchtime. More subtle, but equally important things for health, are whether the usual routine and procedures in the setting welcome some people but exclude others; the opportunity there is to take part in decisions and have one’s say; the number of people in the setting and whether it encourages interaction or alienation. Biologists tell us that to manage and improve the well being of grizzly bears we have *to preserve and manage the habitat*. The principle of settings-focused health promotion is the same.^{37,38}

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