

Prevention, Public Health, and Primary Care

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Prevention: a Definition

The purpose of prevention is to avoid later intervention.

1. Intervening in the chain of “causation”
2. Intervening before any evidence of harm
3. Intervening to avoid deterioration
4. Avoiding harm from excessive interventions

What Is Prevention?

- 1967 measures that limit the progression of a disease at any stage of its course
- 1978 primary (promote health), secondary (early detection), tertiary
- 1998 includes risk factor reduction
- 2003 includes quaternary prevention (avoid over-medicalization)

Sources: Clark & MacMahon. Preventive Medicine. Little, Brown & Co., 1967. Nightengale et al. Perspectives on Health Promotion & Disease Prevention in the United States. Institute of Medicine, National Academy of Sciences, 1978. National Public Health Partnership. Preventing Chronic Disease: A Strategic Framework. Background Paper. National Public Health Partnership, 2001. Bentzen. WONCA Dictionary of General/Family Practice. Laegeforeningens Forlag, 2003.

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The current focus on prevention is on

- creating diseases from risk factors
- transferring the major responsibility for prevention from public health to clinical services
- building markets for the pharmaceutical and other new health industries (new professionals, new professional roles, consulting activities)

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Only 8% of acute CHD events occur in people* without conventional risk factors** but having multiple borderline risk factors***. That is, there is not much advantage in lowering the thresholds for intervention to prevent coronary heart deaths.

The arguments of Geoffrey Rose (concerning shifting the curve for populations) were never intended to be used when the costs are high, when the interventions are invasive, or when the treatments are aggressive and potentially dangerous.

*non Hispanic whites of ages 35-74

***new definitions for prediabetes, pre-hypertension, mildly elevated LDL

** conventional levels for increased risk including elevated blood pressure, fasting blood glucose, abnormal LDL or HDL

Sources: Vasan et al, Ann Intern Med 2005;142:393-402. Kaplan & Ong, Annu Rev Public Health 2007;28:321-44.

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A meta-analysis of observational studies including a million people without cardiovascular disease showed that the risk of subsequent CVD rises with increasing systolic blood pressure about 115 mmHg. A Cochrane review found that tight control of blood pressure (135/85 or lower) does not reduce the risk of cardiovascular complications. A recent analysis showed risks of subsequent left ventricular hypertrophy to be 17% versus 11%* in those with tight versus less tight control (target of less than 130) but the number of cardiovascular events was low.

*odds ratio .63

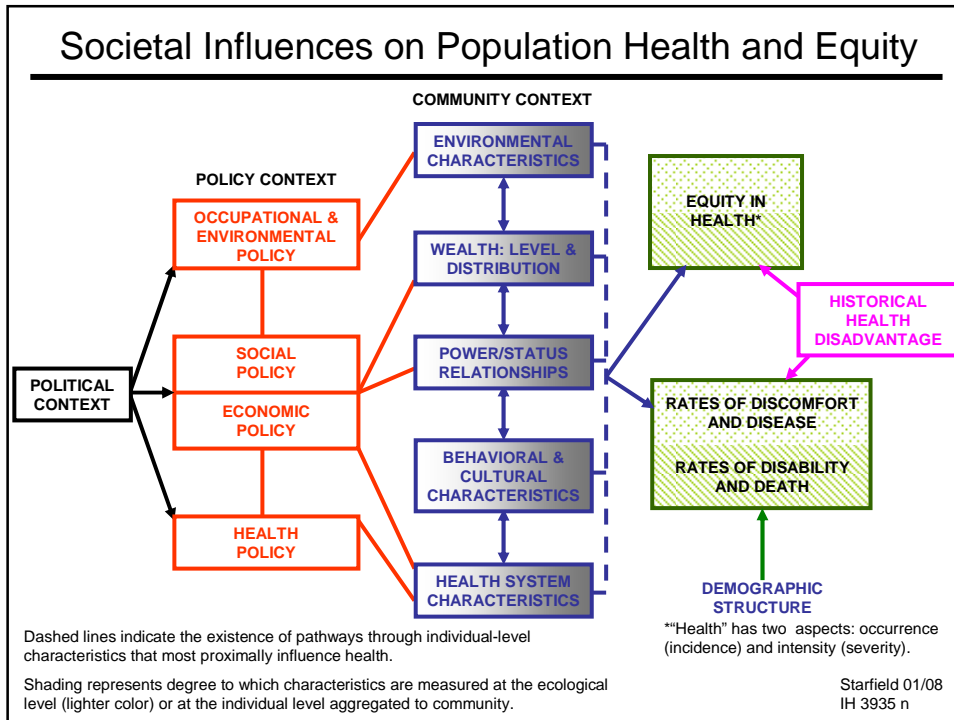
Source: Carlberg, Lancet 2009;374:503-4.

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Why do interventions that are supposedly beneficial have relatively little population impact?
 Why is there so much variability in benefit?

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Societal Influences on Population Health and Equity



Social isolation can impair the transcription of glucocorticoid response genes and increase proinflammatory activity in humans, possibly playing a role in obesity and obesity-related metabolic outcomes.

Automatic brain responses to the reward value of food versus non-food objects are enhanced by marketing and chronic stress.

Source: Huang & Glass, JAMA 2008;300:1811-3.

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Recommendations for clinical prevention are made independently and without regard to patients' individual characteristics. There are few data that can inform decisions about what preventive interventions are of highest priority and in which patients.

Source: Gervas et al, Lancet 2008;372:1997-9.

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Challenges to Prevention

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On average, adult patients in the US in the mid 1990s were estimated to have approximately 12 risk factors requiring approximately 24 preventive services – even before the explosion of the concept of risks.

Source: Medder et al, Am J Prev Med 1992;8:150-3.

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Defining risk factors as diseases changes the balance of activities in health services from treatment of manifest illness, alleviation of dysfunction, and prevention of progression to an increasing focus on

- avoidance of risk factor in individuals
- management of the risk factor in individuals

In some countries (e.g., US, UK), prevention by public health activities is being replaced by care directed at individuals in clinical settings, with unknown effect on population health.

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Types of Interventions

Target group	A. Health protection, promotion, avoiding risk (1 ^o)	B. Early detection (2 ^o)	C. Remediation (3 ^o & 4 ^o)
Generalized			
Populations*			
Individuals			
Selective			
Indicated			

*or all people of a given age

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LINK 3735

Types of Interventions

Target group	A. Health protection, promotion, avoiding risk (1 ^o)	B. Early detection (2 ^o)	C. Remediation (3 ^o & 4 ^o)
Population			
As population*	PH	PH	PH (PC)
All individuals	PH/PC	PH/PC	PH/PC
Selective	?	PC/PH	PC/PH
Indicated	PC/PH	PC/PH	PC (PH)

*or all people of a given age

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LINK 3810 n

Where the risk factor is to be avoided or managed in particularly vulnerable individuals (e.g., those with compromised resilience) rather than in defined population subgroups, the responsibility lies with clinical care.

The challenge is to decide the appropriate locus of responsibility if the risk factor is to be avoided or managed in the general population or in selected subgroups of the population.

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Informed prevention requires knowledge of the natural history of disease in order to avoid intervention when resulting disease is unlikely.

Prediction of benefit depends on the population targeted.

Source: Gervas et al, Lancet 2008;372:1997-9.

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The impact of risk factors for coronary artery disease is greater in more disadvantaged populations.

Source: Lim et al, Lancet 2007;370:2054-62.

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Across developing and middle income countries, societal influences on under-5 mortality DIFFER by income quintiles. For the richest quintile, the higher the Gross National Product, the lower the under-5 mortality. For the poorest quintile, the higher the public spending on health, presence of skilled delivery attendants, and immunization coverage, the lower the under-5 mortality.

(Differences in female literacy, degree of “democracy”, and state strength have no effect on relative rich/poor differences across countries, although they have a major impact on overall under-5 mortality.)

Therefore, provision of at least some aspects of health services reduces rich/poor differences in health, as measured by under-5 mortality.

Source: Houweling et al, Int J Epidemiol 2005; 34:1257-65.

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Benefits of prevention in populations are based on the frequency (as well as the degree of its impact).

Therefore, priorities for prevention in populations cannot be based only on results of clinical studies of the impact of risk factors.

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Population versus Clinical Bases for Health Policy Decisions: an Example

Individual risk factors for tuberculosis in Russia, in order of salience: low household wealth, incarceration in prison or detention, drug misuse, financial insecurity, unemployed, overcrowded living, living with a tubercular person, heavy drinking

Population risk factors for tuberculosis in Russia, in order of salience: unemployment, consumption of raw milk

Conclusion: Health policy decisions should be targeted with consideration of risk factors that are common in populations. The differences between societal and social influences is the difference between population and individual approaches to risk factors.

Source: Coker et al, BMJ 2006; 332:85-7.

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Preventive activities are generally more straightforward than care activities because they are usually routine.

Because preventive activities take time, there is less time available for responding to people's needs and problems.

Source: Gervas et al, Lancet 2008;372:1997-9.

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7.4 hours a day are required to provide evidence-based care to an average practice population of 2500 patients.

Sources: Yarnall et al, Am J Public Health 2003; 93:635-41;
Ostbye et al, Ann Fam Med 2005; 3:209-14.

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In the US, routine visits to prevent disease or deterioration in disease are rapidly becoming the most frequent reason for visits to general internists.

Source: Valderas et al, Ann Fam Med 2009;7:104-11.

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In the US, the effectiveness of preventive measures on life expectancy (19 months) is less than half as great as the prolongation of life from curative measures (45 months). In the UK, the use of ACE inhibitors in heart failure has a potential gain of 308 deaths deferred per 100,000 population per year whereas screening and treatment of hypertension avoids 71 deaths per 100,000 population.

Sources: Bunker et al, Milbank Q 1994; 72:225-58. Fleetcroft & Cookson, J Health Serv Res Policy 2006; 11:27-31.

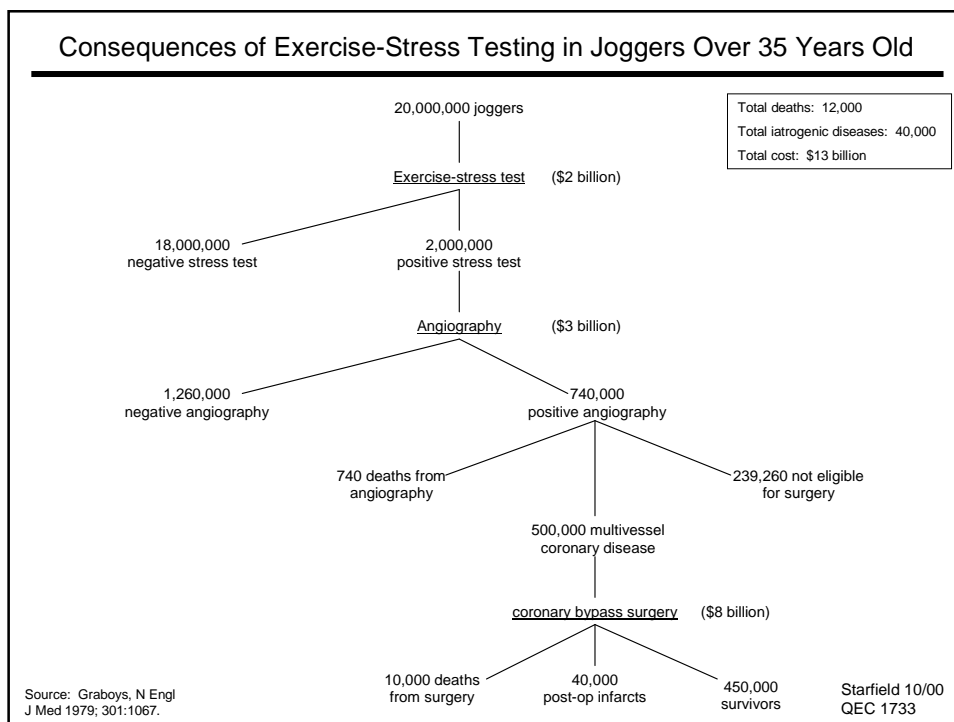
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Prevention can be dangerous.

Prevention is not necessarily safer than care.

Source: Gervas et al, Lancet 2008;372:1997-9.

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As is the case with all medical interventions, each intervention runs the risk of initiating a cascade of interventions, each of them with a risk of adverse effect, thus violating the principle of “do no harm”.

Principles in Thinking about Priorities for Prevention in Populations

- The frequency of risk is at least as important as the degree of added risk.
- Not all abnormalities signify impending health problems.
- Rates of adverse events are rising and countries that do more interventions have higher rates of adverse events.

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In view of the reality that disease is an artificial construct, and that there are multiple influences on the occurrence of illness and interactions among those causes, what can be said about the utility of premature detection of disease in improving health?

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Preventive activities, including screening for disease, will increase disease rates, but the hazards of “early diagnosis” need to be considered.

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Benefits of prevention at younger ages are less efficient than at older ages and the hazard-benefit ratio may be unacceptable.

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The Concept of Prevention Is Not as Valid Now as in the Past

- because the goal is not as clear (what are we preventing?)
- because the chain of influences is much more complex and more variable
- because the likelihood of success is less predictable
- because there is greater likelihood of interference with peoples' lives

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Overarching Principles of Prevention (and Treatment)

- The effectiveness of intervention
- The frequency of the risk factor relative to other risk factors
- The unintended effects of intervention
- Effect on equity in health
- Cost-effectiveness

Source: based on Carlberg, Lancet 2009;374:503-4.

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Public Health

Definition: The science and art of preventing disease, prolonging life, and promoting health through organized societal efforts and informed choices of society, organization of public and private, communities, and individuals. (attributed to CEA Winslow 1920, in Wikipedia)

It requires stewardship, leadership, financing, and resource generation by a publicly accountable body. (Frenk J. Reinventing primary health care: the need for systems integration. Lancet 2009;374:170-3.)

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Premises

Core public health functions are:

- Assessment of population needs
- Policy development
- Assurance of adequacy in meeting needs
(IOM, 1988)

Core clinical tasks are:

- Recognizing health problems/needs of patients
- Responding to these problems/needs
- Assessing adequacy of response

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Types of Interventions

Target group	A. Health protection, promotion, avoiding risk (1 ^o)	B. Early detection (2 ^o)	C. Remediation (3 ^o & 4 ^o)
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Indicated			

*or all people of a given age

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Levels and Types of Interventions to Improve Health*

	Societal (population) level	Individual level
Physical environment	Environmental planning, monitoring, regulation	Responsible use of environmental resources
Social environment	Public advocacy, community mobilization	Promotion of solidarity
Health services environment	Resource mobilization/deployment	Early recognition of problems regardless of their genesis
	Information systems: collection, analysis, and dissemination for early identification of problems and iatrogenesis	
Personal environment	Genetic engineering	Responsible stewardship of one's health

*Locus of responsibility may vary from one jurisdiction to another but must be explicit and with accountability.

Source: Sheridan et al, Am J Prev Med 2004;26:56-66.

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Loci of Prevention

In a survey of conventional preventive activities in 8 areas of 6 countries, there was no consensus

- on whether services are targeted at populations, particular population subgroups, or individuals
- on the locus of activity for policy development, procedures for contact or follow-up, or record keeping, particularly for the problematic groups of ALL INDIVIDUALS in the population and SELECTED INDIVIDUALS in the population

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Interventions to reduce all coronary heart disease risk factors to the target levels in Healthy People 2010* that focus on all social groups would produce the best overall results for both population levels and inequities in health in coronary heart disease deaths.

Corollary: population-based strategies** for common chronic diseases are likely to be more effective (while improving equity) than are strategies targeted to particular disadvantaged groups or individuals.***

*US targets for prevention; **such as taxes on harmful products, food prices and availability;
***except demographic ones such as age

Source: Alvarado et al, Circ Cardiovasc Qual Outcomes 2009;2:DOI:
10.1161/CIRCOUTCOMES.109.884601, published online August 25.

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The Role of Primary Care in Prevention

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PC 4264

Primary health care is primary care applied on a population level. As a population/public health strategy, it requires the commitment of governments to develop a population-oriented set of primary care services in the context of other levels and types of services.

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PC 3755 n

Primary care is the provision of first contact, person-focused, ongoing care over time that meets the health-related needs of people, referring only those too uncommon to maintain competence, and coordinates care when people receive services at other levels of care.

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PC 3756 n

As primary care changes to care for defined populations through organized societal efforts, its overlap with public health will become greater. As that happens, their relative roles must become clearer, with public health having the responsibility for interventions directed at whole populations and for problems that are so common that it is not efficient to do them individual by individual in clinical practice. Whether or not market-oriented health systems can do this is an open question.

LINK

“Swine Flu: Public Health Has Become a Public Nuisance”

“The moralising propaganda of public health has a generally demoralising effect on society – encouraging fear and anxiety – and attendant sentiments of stigma and blame. It has a degrading effect on medical practice and is corrosive of good relationships between doctors and patients. As the swine flu scare confirms, it is also disruptive of day-to-day medical practice.”

Source: Fitzpatrick, Br J Gen Pract 2009;59:615.

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- Primary care is neither public health nor prevention.
- Primary care is an approach to delivering services that maximizes effectiveness, efficiency, and equity in health.
- Clinical “primary care” will never assume all of the functions of public health because the stewardship, leadership, and other system functions have to be assumed by a publicly accountable body.
- Clinical primary care should not assume the burden of prevention, because the genesis of illness lies far beyond the health system. The best it can hope to do is assure that the portion it assumes is more effective, more efficient, and more equitable than can be done by public health and intersectoral efforts. This is increasingly proving not to be the case, especially in countries with weak primary care.

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PC 4265



Hypothesis

Extent to which services directed at individuals in populations are carried out by public health depends on the degree to which primary care services are responsible for defined populations.

Corollary

Countries such as the UK and Denmark, with defined populations in primary care, would be expected to have more of these services in the primary care sector.

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LINK 1955

Corollary

In countries where primary care services are not directed at populations, provision of population-focused services (such as immunizations) in the primary care sector signifies inadequate public health services.

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