

REPRINTS AND REFLECTIONS

Public health aspects of weight control

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The major American health problems of today are perhaps most strikingly illustrated by comparing the mortality rates of adults in the United States with similar rates for certain other countries.

We may properly take pride in the increasing longevity of our population, in our low infant mortality rate, and in the rapid decline of our tuberculosis death rate. But we tend to let the bright light cast by these advances blind us to the shadows in our health picture. One of these shadows is the fact that the age-adjusted mortality rate from all causes among white males over 45 years of age is significantly higher in the United States than in many of the countries of Western Europe and English-speaking countries elsewhere. This is illustrated in Table 1.

According to this table, the mortality rate for American white males over 45 years of age exceeds that of Norway by more than 30 per cent, the other countries showing a somewhat lower ratio. The differences are chiefly accounted for by the cardiovascular-renal death rate.

This evidence of lag in America's health cannot be explained by statistical differences in the age-distribution of the population. Examination of the age-specific rates for males by 5-year age brackets from 45 to 64 reveals that the differential between the United States and these other countries is quite consistent.¹ After age 65 the difference becomes less substantial. This means that America's loss of men in their late prime is far greater than that of these other countries.

The problem of excessive mortality from cardiovascular-renal diseases among American men is high lighted not only by international comparisons. It is also apparent by study of trends within the United States. Moriyama and Woolsey² have noted a significantly increasing mortality rate from this cause among American white males aged 35–64 years since 1920. They state:

Of the various problems raised in the analysis of mortality for these Statistical Studies of Heart Disease, that of the increasing risk of death from the major cardiovascular-renal diseases among white males between the ages 35 and 64 years is the most challenging... The changes cannot be explained as an effect of the aging population... The increases in male mortality rates appear to be occurring in the most productive working ages.

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¹ Presented at the Annual Meeting of the Western Branch, American Public Health Association, Denver, Colo., June 6, 1952.
First published American Journal of Public Health. 42 (9):1116–20, 1952 Sept. Reprinted with permission.

Table 1 Death rates per 100,000 Males at Ages 45 and Over for Certain Causes: United States (White) and Selected Countries, Postwar Experience

Country and Year	All Causes	Cardiovascular-Renal	Cancer	Accidents
United States (white) 1948	3,127	1,852	455	150
New Zealand 1949	2,849	1,719	458	72
Canada 1948	2,844	1,658	451	127
Denmark 1949	2,519	1,159	476	85
Netherlands 1949	2,503	1,056	501	66
Norway 1948	2,372	877	460	95

Abstracted from Table 2, page 425, Dublin, Louis I., and Spiegelman, Mortimer. Factors in the Higher Mortality of Our Older Age Groups. A.J.P.H. 42, 4: 422–429 (Apr.), 1952.

The cardiovascular-renal diseases (and diabetes) are frequently referred to as "degenerative diseases." If this terminology is accurate, then it follows that American white males "degenerate" more rapidly today than do the Norwegians or Dutch, and more rapidly than did Americans of even one generation ago. Actually, the term "degenerative" should not be applied to these diseases. The evidence that they are degenerative is no more convincing than evidence which might have been adduced a century ago to support the thesis that tuberculosis was degenerative. Instead of accepting such a defeatist philosophy, we should undertake epidemiologic investigations of these diseases in order to pin point etiologic factors and to establish control measures based upon our findings.

One such factor has already been well established, namely the close association between overweight and excessive mortality from several of these chronic diseases. According to Table 2, which is based upon Metropolitan Life Insurance Company experience, the greater the degree of overweight, the greater is the mortality from all causes and especially from organic heart diseases, nephritis, cerebral hemorrhage, and diabetes. The diabetes death rate among persons who are more than 25 per cent overweight is 13 times higher than for persons who are slightly underweight. Even a "little" overweight, 5–14 per cent above normal, induces a substantially increased mortality rate from all causes, especially the cardiovascular-renal diseases and diabetes.

Of greatest interest perhaps is the fact that even so-called "normal" weight persons suffer a greater mortality from these chronic diseases than do those who are "underweight". It is evident that so far as mortality from these diseases is concerned, the Metropolitan Life Insurance Company's insured population (and probably Americans generally) are on the average

Table 2 Ages combined, Standardized Death Rates per 100,000 Population for Specified Causes of Death, All by Weight Class

Cause of Death	Underweight		Normal Weight	Overweight		
	15-34 Per cent	5-14 Per cent		5-14 Per cent	15-24 Per cent	25 Per cent +
All causes	913	833	844	1,027	1,215	1,472
Organic heart diseases	63	66	80	115	135	129
Nephritis	56	64	82	108	202	224
Cerebral hemorrhage and apoplexy	46	50	70	101	115	170
Diabetes	9	9	14	22	45	117

Based on mortality experience of about 200,000 insured lives. Abstracted from Table 48, page 195, L.I. Dublin, A.J. Lotka, and M Spiegelman, *Length of Life*. New York: Ronald Press, 1949.

overweight. To consider the American average as "normal" is misleading because apparently even the average is so high that it induces excessive mortality. Optimum weight would be less than our average.

It should also be noted that overweight is associated with higher mortality from cirrhosis of the liver, appendicitis, hernia, gallbladder disease, and other conditions.³

Recently, it has become fashionable to introduce a skeptical note into the discussion of overweight and excessive mortality by pointing out that no one has proved that overweight *causes* death, or even heart disease. Perhaps the association is a statistical artifact. It might be well to recall the position of the epidemiologist a century ago who demonstrated that persons who drank water from one source suffered a much higher incidence of typhoid fever than did persons who drank from another source. No one had proved that drinking water from the first source *caused* typhoid fever. As a matter of fact, not everyone who drank such water contracted the disease; and some persons who drank only from other sources did get typhoid fever. Yet, it was very clear that if one wished to diminish his chances of acquiring typhoid fever he would avoid drinking from the source which was associated with a high incidence of the disease. Therefore, today, it seems reasonable to suggest that avoiding overweight will diminish one's chances of dying prematurely from cardiovascular-renal disease and diabetes.

If it is acknowledged that prevention of overweight reduces the likelihood of premature mortality from these chronic diseases, the next question is: Will weight loss benefit the individual who is already overweight? Or does being overweight produce irreparable damage? Recently, some striking evidence of the value of reducing overweight persons has been made available.

Dublin and Marks³ analyzed the experience of individuals who had been issued insurance by the Metropolitan Life Insurance Company during 1925-1934, but who had been "rated", that is, charged higher premiums because they were overweight. Some, with expected mortalities varying from 30 to 50 per cent above standard, are classified as moderately overweight. Among males in this group who were moderately overweight the mortality was 142 per cent, of the expected rate, based upon standard risks (Table 3). Thus, a moderate degree of overweight was associated with a death rate almost 1½ times as great as the death rate among insured persons of average weight.

Table 3 Per cent Actual of Expected Deaths Among Persons 20-64 Years of Age "Rated" for Over-weight - All cases and Cases Which Subsequently Received Lower "Ratings" After Reduction in Weight

Sex	All Cases		Rerated Cases	
	Moderately Overweight	Severely Overweight	Moderately Overweight	Severely Overweight
Males	142	179	113	109
Females	142	161	90	135

Modified from Table 9, *Mortality among Insured Overweights in Recent Years* by L.I. Dublin and H.H. Marks, Sixtieth Annual Meeting of the Association of Life Insurance Medical Directors of America, October 11-12, 1951.

Extreme overweight (expected mortalities of 50-150 per cent above standard) was associated with a greater degree of mortality, particularly among males where the mortality rate was 179 per cent of the standard. Among females, the findings were similar.

Some individuals in the group who had been "rated" because of overweight subsequently reapplied for insurance after weight reduction. The mortality rates of this group approached the standard experience, even though at one time they had been considered a high risk group due to overweight. Among males who had previously been in the severely overweight group having a mortality experience of 179 per cent of standard, the mortality rate after weight reduction was only 109 per cent of standard.

As Dublin and Marks comment: "This is perhaps the best evidence produced to date that there is long-range benefit from weight reduction, and this should support our public health propaganda for weight control."

The data presented in these tables support three important conclusions:

First, America's health as measured by the mortality of white males in the productive ages of 45-64 years, is lagging behind that of several other countries.

Second, excessive mortality from the diseases principally responsible for this lag - the cardiovascular-renal disease group - is closely associated with overweight.

Third, reduction of overweight results in more favourable mortality experience for the individuals concerned.

These conclusions become even more significant when we realize that a substantial proportion of Americans are overweight. One out of 6 "well people" examined in the Boston Health Protection Clinic were 20 per cent or more overweight,⁴ and 2 out of 5 among a group of men employed in a physically arduous occupation in San Francisco were 20 per cent or more overweight.⁵ It is clear that weight control is a major public health problem today.

What can be done about it? Two approaches are suggested.

One is the mass approach, namely, popularising the ideal of optimum weight. The American people have learned that good hygiene does not permit spitting on the floor; they are beginning to learn that good hygiene requires the safe driving of automobiles, but they have hardly begun to appreciate the importance of optimum weight in good hygiene. Here is clearly a task for public health.

A second approach which has recently attracted attention is the group method of weight control. With the assistance of the

California State Department of Public Health, a project is now under way at the Herrick Hospital in Berkeley, to evaluate the effectiveness of this method. Groups of 10–25 overweight persons, with a leader from the professional staff, meet regularly over a period of several months. Through the influence and stimulus of the group they attempt to accomplish that which they have not achieved by individual effort alone – namely, reduction in weight. Although the project has not been completed, preliminary reports by the director, William Simmons, indicate considerable promise from this method.

A similar undertaking at the Boston Dispensary of the New England Medical Center has likewise shown encouraging findings.⁴ Many other endeavours of this sort are being initiated over the country. It is, of course, too early to judge the ultimate worth of these projects. Such judgement must await continuous follow-up of individuals showing early benefit, as well as long-term follow-up of persons who do not show early improvement but may show long-term benefits. However, the results to date are sufficiently encouraging to justify the more widespread application of this method under proper conditions, including adequate evaluation.

In addition to developing control measures based upon present knowledge, it is also important to define more precisely the relationship between over-weight and excessive mortality. There is need for better measures of overweight itself; investigation of the significance of specific nutritional elements

such as cholesterol; long-term observation of individuals who gain, maintain, or lose substantial amounts of weight at different periods of life, and many other studies.

Practically every member of the public health team has a contribution to make in developing and applying effective methods for weight control. It is now one of our major responsibilities.

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Commentary: On ‘public health aspects of weight control’

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My comment on the paper¹ touches briefly on: (i) the context at the time of writing it, (ii) some important advances on the topic since that time, and (iii) the current obesity epidemic.

The paper appeared as part of a growing chronic disease control programme in the California Department of Public Health, which reflected recognition of the epidemiological transition, i.e. ascendancy of the chronic non-communicable diseases over the communicable diseases as the major health problems.^{2,3} In particular, cardiovascular disease had been expanding substantially during the first half of the century owing in considerable part to excessive weight among increasing numbers of people.

Not all public health leaders immediately accepted the idea being advanced that public health should become involved in chronic disease control. The California Director of Public Health first advised, when I initiated such a proposal in 1946, to ‘go back to Minnesota (where I had come from) and try those notions out there.’ He later agreed to establish a Bureau of Chronic

Disease in the Department when federal funds became available for cancer control. Kenneth Maxcy, who asked me to write a chapter on chronic disease for the 1951 edition of *Preventive Medicine and Hygiene*, insisted that the title of the chapter be *Diseases of Senescence*. This mirrored the common belief that cardiovascular disease, cancer, and the like were ‘degenerative’ diseases due to aging and not preventable. We compromised on *Senescence, Chronic Disease, and Disability in Adults*.

The scientific base for including weight control as an important element in the public health approach to the chronic disease problem then consisted largely of the findings by life insurance company actuaries and by Public Health Service statisticians.^{4,5} Experience in ‘rating’ life insurance premiums to reflect mortality risk showed that being overweight constituted a substantial mortality risk and that losing excessive weight returned people towards the ‘standard’ mortality pattern.⁶

The 1952 paper on *Public Health Aspects of Weight Control* suggested three approaches for public health to adopt for obesity control: (i) popularize the ideal of optimum weight as an aspect of