Impact of height and weight on life span

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The study was conducted to evaluate one aspect of the entropy theory of aging, which hypothesizes that aging is the result of increasing disorder within the body, and which predicts that increasing mass lowers life span.

The first evaluation of the impact of human size on longevity or life span in 1978, which was based on data for deceased groups of athletes and famous people in the USA, suggested that shorter, lighter men live longer than their taller, heavier counterparts. In 1990, a study of 1679 deceased men and women from the general American population supported these findings.

In the present study data on the height, weight, and age at death of 373 men were obtained from records at the Veterans Administration Medical Center, San Diego, CA, USA. Men of height 175.3 cm or less lived an average of 4.95 years longer than those of height over 175.3 cm, while men of height 170.2 cm or less lived 7.46 years longer than those of at least 182.9 cm. An analysis by weight difference revealed a 7.72-year greater longevity for men of weight 63.6 kg or less compared with those of 90.9 kg or more. This corroborates earlier evidence and contradicts the popular notion that taller people are healthier. While short stature due to malnutrition or illness is undesirable, our study suggests that feeding children for maximum growth and physical development may not add to and may indeed be harmful to their long-term health and longevity.

The entropy theory of aging predicts that increasing mass lowers life span, and hypothesizes that aging is the result of increasing disorder within the body (*1*). This movement towards disorder or increased entropy is related to time, the mass of the body, its total energy content, and the nature of the mass and energy transactions.[a]

Among some groups in the USA, e.g., baseball players and famous people, the results of previous studies have suggested that increased height and weight are associated with decreased longevity (*2, 3*). We therefore decided to study the relationships between these parameters in a different population sample.

The following hypothesis was investigated in the study: as humans become taller and proportionately heavier, their longevity decreases in proportion to their increase in height and absolute weight.

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[a] The entropy (disorder level), S, of a system at a point in time is expressed mathematically as $\log g(N, U)$, where g = number of states the system can have, which is a function of N, the number of particles (mass), and U, the energy of the system.

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Materials and methods

The study subjects consisted of 373 male veterans who died between 1984 and 1988, mostly in the Veterans Administration (VA) Medical Center, San Diego, CA, USA.

Characteristics of the study sample

The ages at death of the individuals in the study ranged from 29 to 97 years. Both the mean heights and weights of the study population were within the norms for the USA: the mean height of the subjects was 175.3 cm, which is close to the national average for men in this age group, while the mean weight was 73.2 kg, which falls within the desirable weight range of 68.6–74.1 kg for men of height 175.3 cm and of average frame, as recommended by life insurance companies. The average age at death was 68.11 years, which is close to the life expectancy of 69.1 years for a man aged 25 years in 1940 (many of the men in the sample were roughly 25 years of age in 1940–43 and were in military service during this period). The body mass index (BMI) (weight (kg)/height^2 (m^2)) for men of height ≤175.3 cm was 22.9 and for men of height >175.3 cm, 23.1.

The causes of death were predominantly from age-related and alcohol-related illnesses, e.g., heart failure, cancer, stroke, and liver disease. A review of the causes of death indicates than cancer and heart

disease deaths accounted for about the same proportion of tall and short men; however, shorter men were, on average, a few years older when they died from these diseases.

Because the proportion of females in the group was quite low, we included only males. Most subjects were Caucasians; Asians, Blacks and Hispanics represented about 7% of the 373 subjects.

Data collection

The data were obtained directly from each deceased patient's medical records. The data were recorded by one author and checked by the other. For each subject, height was recorded in inches and converted to cm, weight was measured in pounds and converted to kg, and the age at death was calculated by subtracting the date of birth from the date of death. As in conventional usage, a person was considered to be at a given age from one birthday to the next. The heights and weights were obtained from notes made by the nutritionists, who obtained the data from the nursing staff. Nursing practice at the VA Medical Center is to weigh each patient on admission. However, each individual was asked to state his height, and only if he did not know or seemed uncertain was it then measured.

Hospital records were obtained unselectively. Records of deceased patients were examined by one author, who started at the left end of the shelf where the records were stored and examined each in succession until recording was completed for that day. The other author then scrutinized the same files and verified the data recorded.

Statistical tests

Pearson product–moment correlation coefficients were computed for height, weight, and age at death. Student's *t*-tests were used to compare the mean ages at death between men of height ≤175.3 cm and those of height >175.3 cm and between those of height ≤170.2 cm and those of height ≥182.9 cm. To compare the mean age at death for men weighing ≤63.6 kg with those weighing 63.6–90.9 kg and those weighing ≥90.9 kg, we carried out analyses of variance and specific comparison *t*-tests.

Results

Height versus age at death

As shown in Table 1, the men in our sample whose height was ≤175.3 cm had a mean age at death of 70.58 years. This contrasts with men of height >175.3 cm, whose mean age at death was 65.63 years, i.e., 4.95 years less than that of the shorter group. Men of height ≤170.2 cm lived, on average, 71.10 years, while those who were ≥182.9 cm tall lived on average, 63.64 years, a difference of 7.46 years. These differences are statistically significant at the 0.0001 level using Student's *t*-test.

An additional comparison was made between those of height ≤167.6 cm and those of height ≥180.3 cm: the shorter men lived, on average, 5.7 years longer (70.6 years versus 64.9 years).

Weight versus age at death

The men in this study who weighed ≤63.6 kg lived an average of 71.68 years, while for those weighing ≥90.9 kg the comparable age was 63.96 years, a difference of 7.72 years ($P < 0.0001$ in both cases). Men of weight between 63.6 kg and 90.9 kg lived, on average, 67.00 years, significantly longer than heavier individuals and significantly less than lighter people ($P < 0.001$ in both cases). Table 1 shows the results of the comparison of weight versus age.

The group weighing 72.7–81.8 kg was also investigated. The life span for this group averaged 66.9 years, 4.78 years less than that for the lighter (≤63.6 kg) group, and 2.94 years more than that for the heavier (≥90.9 kg) group.

Correlations

The product–moment correlation between height and age at death was – 0.228; the correlation between weight and age of death, – 0.203; and the correlation between height and weight, 0.419. The multiple correlation of age at death with height and weight was 0.257 with beta weights of – 0.174 and – 0.130. All correlations were statistically significant ($P < 0.001$).

Discussion

The results of the study show a clear negative relationship between height and longevity as well as that lighter men live longer than heavier men. Height and weight appeared to have an equal impact on life span. Since greater height is generally associated with increased body mass, the results support the prediction of the entropy theory of aging—that aging is promoted by increased body weight.

Data from other studies

Miller published the results of research on data on 1679 deceased individuals provided by the Cuyahoga County Coroner's Office, Cleveland, OH, USA, and

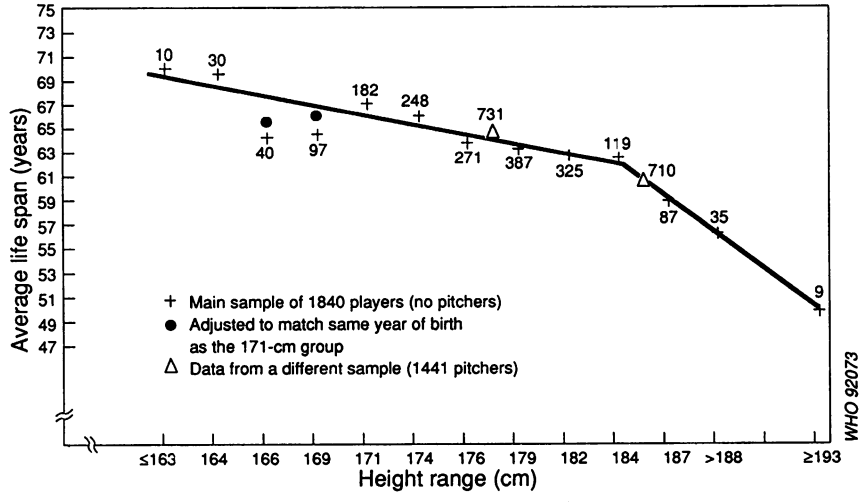
Table 1: **Height, weight, and life span of the deceased veterans in the study**

Height versus age at death				Weight versus age at death			
Sample size	Height (cm)	Average age at death (years)	Shorter group's longer life span (years)	Sample size	Weight (kg)	Average age at death (years)	Lighter group's longer life span (years)
178	≤175.3	70.58	4.95	116	≤63.6	71.68	4.68
195	>175.3	65.63		211	>63.6, <90.9	67.00	7.72
91	≤170.2	71.10	7.46	46	≥90.9	63.96	
71	≥182.9	63.64					

found that longevity was inversely related to height for both men and women (*3*).When men and women of the same height were compared, he found that their longevity was about the same. A linear regression analysis provided a 0.47 years/cm decline in longevity. This compares closely with the results of our calculations (see Table 4), which provide an average of 0.51 yr/cm for a variety of ethnic groups. The California, White male–female comparison shown in Table 4 gave a value of 0.47 yr/cm—the same as Miller's figure. Miller also reported (personal communication, 1990) that a study of 102 deceased basketball players of average height 193 cm indicated that they lived an average of 50.46 years. Analysing the data used to prepare the chart for baseball players shown in Fig. 1, we found that players of height ≥193 cm lived an average of about 50.5 years. Review of data from the VA Medical Center revealed seven men of height ≥193 cm, with an average age at death of 49.1 years. Another source provided 48 baseball pitchers of height ≥193 cm, whose average age at death was 59.5 years (*4*) (five of the pitchers lived to be 80–87 years). Combining all data (sample size, n = 166) for very tall men gave an average longevity of 53 years.

No other studies were found that correlated height, weight, and age at death. However, a number of publications provided height, weight, and death

Fig. 1. **Plot of height versus average life span of professional baseball players** (data obtained from ref. *4*).



statistics for professional baseball players and other athletes. One source on famous baseball players provided data on almost 400 deceased players. Karst & Jones reported the heights and weights of players during their playing years together with their birth and death dates (*5*). The results showed that players of height ≤175.3 cm lived an average of 5.6 years longer than players of height >175.3 cm.

Another more extensive coverage of deceased professional baseball players was provided by Reichler, who gave data on over 3200 deceased players (*4*). Fig. 1 shows a plot of these players' ages at death for heights over the range ≤162.6 cm to ≥193 cm. A steady decline in average age at death is evident as players' heights increased. Two heights (166.4 cm and 169 cm) provide anomalies. These could have been caused by the small sample sizes or because the average dates of birth of these players was 6 years earlier than those of height 171 cm, who had a longer average life span. After making adjustments for an approximately 2-year lower life expectancy for this year of birth, the adjusted ages shown follow reasonably closely the overall trend.

The data for weight versus age at death for the baseball players were also consistent with the results of the VA Medical Center study. The lightest players lived, on average, 7.1 years longer than the heaviest. Another source of data on height, weight, and age at death was the *Current biography yearbook* (*6*). Deceased famous people from a variety of professions were identified in this series of annual biographies going back to 1940, and height and weight data on about 50% of the deceased were provided. The sample size was 253, and men of height ≤175.3 cm lived on average 4.6 years longer than those of height >175.3 cm. Men of height ≤175.3 cm had an average weight of 71 kg, while the average for those of height >173.5 cm was 81 kg.

Samaras published a report on height versus longevity in 1978 (*2*). Several groups were studied including U.S. Presidents, baseball players, football players and superstars: a 10–15% longer life span was found for shorter men.

Body build and longevity

The impact of body type on longevity has been discussed for many years. Spain et al. found that mesomorphs, mesomorph–endomorphs, and endomorphs had higher death rates from heart attacks than ectomorphs or thinner people (*7*). Life insurance companies have also conducted studies on the mortality rates of people of the same height and different weight ranges. The Metropolitan Life Insurance Company has produced widely published ideal weight tables for each height based on the results of these studies. A recent study of about 116 000 nurses found that the incidence of coronary heart disease increased rapidly for women in the 30–55-year age group with even slight increases in weight (results were adjusted for smoking and age) (*8*). Increases in the Quetelet index (BMI) from <21 to ≥29 were positively correlated with the occurrence of heart disease. Another study, which followed 18-year-old Dutch men over a period of 32 years, found an increase in mortality with increasing BMIs over the range 19 to ≥25, although for BMIs ≥25 increased mortality was demonstrated only with a follow-up of more than 20 years (*9*). Men with a BMI <19 had increased mortality, a finding which disappeared after adjustment for initial health status.

The results of the VA study that we have described here could not be used to compare body type and longevity because of the small sample size in

Table 2: **Body build versus longevity, based on baseball players' weights during their playing careers**[a]

Weight groups, BMI,[b] and longevity \ Average height (cm)	165	168	170	173	175	178	180	183	185	188
Lower weight group (kg)										
Average age (years)	71.3	66.1	60.9	69.3	65.9	63.6	63.2	63.5	60.7	60.8
BMI	24.0	22.5	22.6	23.1	23.6	23.4	22.8	22.1	23.1	23.1
Higher weight group (kg)										
Average age (years)	65.7	62.9	62.2	66.0	60.9	62.0	61.9	61.6	58.7	57.7
BMI	26.7	26.1	25.5	26.6	26.7	25.4	25.0	26.1	25.5	26.0
Increased longevity for lower weight group in years	5.6	3.2	−1.3	3.3	5.0	1.6	1.3	1.9	2.0	3.1

[a] Total sample sizes by height were as follows: 165 cm (15); 168 cm (43); 170 cm (77); 173 cm (131); 175 cm (150); 178 cm (236); 180 cm (178); 183 cm (202); 185 cm (130); and 188 cm (116). The following weight differences were found between lighter and heavier players for each height group: 165 cm (7.3 kg), 168 cm (11.8 kg); 170 cm (8.6 kg); 173 cm (10.4 kg); 175 cm (9.5 kg); 178cm (6.4 kg);180 cm (5.4 kg); 183 cm (9.1 kg); 185 cm (8.2 kg) and 188 cm (10 kg).

[b] BMI = body mass index.

each height group. However, *The baseball encyclopedia* provided extensive data on baseball players by height and weight (*4*). Since the weights of these individuals were given for their playing careers, it is reasonable to assume that these weights were largely due to muscle and bone mass and not excess fat. Thus this data source provided a population that could be examined in terms of ectomorphic and mesomorphic body types and associated longevity.

The results of our analysis are summarized in Table 2, which indicates that for the same height lighter men lived longer. Baseball players were categorized into 10 height groups (165–188 cm) and were assigned to one of two weight classes, which were selected such that approximately equal numbers of players could be placed in the lighter and heavier groups. Since their heights were the same, the lighter athletes tended towards the ectomorphic or ectomorphic–mesomorphic body types, and the heavier men to the mesomorphic and possibly mesomorphic–endomorphic. The weight differences within the various height groups ranged from 5.4 kg to 11.8 kg. Table 2 shows that within each height group the lighter men lived longer than their heavier counterparts, except for the 170-cm group. The reason for this exception is not known, although the sample size may have been too small to overwhelm a short-term random bias in the data. The large differences in longevity of several of the height groups in Table 2 are probably exaggerated because of small sample sizes. Based on the three largest height populations (178 cm, 180 cm and 183 cm), it appears that for the same height the heavier athletes lived 1 year less than the lighter athletes for every 4.55 kg of excess weight. We believe that this is a more realistic figure and compares closely with VA data (0.8 years per 4.55 kg) for men of weight ≤63.6 kg compared with men of weight ≥90.9 kg.

Mortality studies provide mixed results. Early studies by insurance companies[b] showed that tall men had excessive mortality rates. The 1979 Build Study showed that the shortest men in the 50–59-year age group had a 20.8% higher mortality rate than the tallest men, while for the 60–69-year group short men had a 1.48% higher mortality. The tallest women in the 50–59-year group had a 32% higher mortality than the shortest, and in the 60–69-year age group the tallest women had a 27.7% higher mortality compared with the shortest. The data were for groups with and without minor impairments. The data in the 1979 study were only for people accepted for insurance and who had no significant medical impairments (M.J. Rich, personal correspondence, 1979).

A 6-year study of 12 695 Swedes found a 13% higher mortality for short people compared with tall ones, when the data were adjusted for socioeconomic factors; however, the National Center for Health Statistics, Washington, DC, has reported no relationship between height and longevity. As mentioned below, Albanes et al. at the National Cancer Institute found that taller people had a significantly higher death rate from cancer than short individuals. Also, an analysis of data from the 1985 Health Interview Survey (U.S. National Center for Health Statistics) has indicated that for the age range 24–65 years taller men and women were ill more often than shorter ones (*23*).

Studies by insurance companies and others differ from our study in several respects; for example, method of sample selection, limited age range or period studied, and use of death rates versus average age at death of the total population selected for study. Also the socioeconomic differences between tall and short people are often not considered. For example, lower socioeconomic groups generally are shorter and heavier for their height, smoke more, and have higher death rates than upper socioeconomic groups. Thus, shorter individuals appear to have higher mortality rates than tall ones if a high percentage of short, lower socioeconomic groups are included in a study (*10*).[c]

Supporting data from other sources

Support for the hypothesis that life span is affected by size and energy consumption comes from several other sources. McCay's classic experiments with rats in the 1930s and 1940s indicated that underfeeding was the most effective method for significantly increasing their life span (*11*). McCay et al. found that rats which were underfed from shortly after birth were not only smaller, but lived 50–100% longer than rats which ate all they wanted.

These experiments have subsequently been duplicated by many workers, including Ross et al. and Walford (*12, 13*).

The studies by Ross et al. found that experimental animals which had greater weight at maturity were generally shorter lived and had an increased risk of incurring one or more age-related diseases. (M.H. Ross, personal correspondence, 1980).

[b] *Medical impairment study, 1929.* New York, the Actuarial Society of America and the Association of Life Insurance Medical Directors, August 1931, p. 141.

[c] *Height and weight of adults 18–74 years by socioeconomic and geographic variables.* Washington, DC, U.S. Department of Health and Human Services, August 1981, p. 7 (PHS 81–1674, Md).

Table 3: **Life expectancy versus height and weight data, by ethnic origin, for California, 1979–81**[a]

Ethnic origin	Males			Females		
	Life expectancy (years)	Height (cm)	Weight (kg)	Life expectancy (years)	Height (cm)	Weight (kg)
Asian	79.2	168.9	67.3	85.8	156.7	53.6
Spanish surname	72.0	171.7	75.9	79.4	158.2	63.6
White	71.3	178.1	79.1	78.4	163.3	62.7
Black	65.6	178.1	80.5	74.3	163.8	68.6

[a] Data were obtained from the documents cited in footnotes *d* and *e* (see text).

The relationship between breast cancer and body size has been studied by de Waard for many years. His findings indicate that height and weight, rather than obesity, are risk factors for breast cancer: the tallest and heaviest women, with the greatest body volume, also had the highest incidence of breast cancer (*14*).

Comfort has reported that within a species, the smaller members generally live longer than the larger, and states that dogs, horses, and other animals follow this rule (*15*). Also the 30.5-cm shorter and lighter Asian elephant lives about 20 years longer than the larger African elephant.

A report prepared by the California Center for Health Statistics revealed that the life expectancy of various ethnic groups differed significantly over the period 1979–80.[d] Table 3 shows the data provided in this report on life expectancy. Height and weight data for each of these groups were obtained from another Californian report on hypertension, which also showed that among Asians and Hispanics living in California hypertension was less extensive than among Whites and Blacks.[e] For Asians these findings are not surprising, since Japanese have the longest life expectancy in the world, and the shorter and lighter Okinawans live longer than the mainland Japanese. In the absence of the results described in this article, it might be assumed that the smaller Asians live longer because of their diet and life-style. However, the pattern for both men and women appears to be due to height and weight differences, since Hispanics tend to be heavier in proportion to their height and are generally of lower socioeconomic status. The large difference between Asians and Blacks is probably due to additional factors associated with environment, educational levels, and diet.

Stini compared height differences between sexes in many countries and found that men are consistently taller than women throughout the world (*16*). Comparison of the average difference in height with the average difference in life expectancy at birth (from ref. *17*) indicates than men have a 7.3% greater height and a 7.5% lower life expectancy than women. Since the average ages of the men and women in Stini's study were not given, we used 1979 life-expectancy data for this comparison. Similar comparisons were made using the statistics for California (Table 4), which show a change in life expectancy per centimetre of height ranging from 0.4 years to 0.63 years. Also, male-to-male life expectancy dropped roughly by the same percentage as that of taller stature. Thus, it is likely that important factors for longer female life expectancy are shorter height and lower weight, with weight being about 20% greater for the taller males. Certainly, other factors can contribute to greater female life spans, e.g., lower metabolic rates, greater proportion of brain-to-body weight, tendency to take better care of their health and perhaps other physiological differences. However, females have some natural obstacles to their longevity, such as a more complex reproductive system, the risks at childbirth, and a higher proportion of fat to body weight (which may promote breast cancer), and until lately, they have not exercised on a regular basis. However, in recent years, they have tended to be lighter in proportion to their height than men, which is beneficial to their health and longevity, provided basic nutritional needs are satisfied.

When Stini's height differences were separated into two groups — those with the largest and those with the smallest differences between male and female heights — it was found that the group with the smallest difference in height also had the smallest difference in life expectancy.

Note that the last two rows in Table 4 compare taller and shorter men from the VA Medical Center and baseball player data samples.

Albanes et al. have reported that short stature is associated with reduced risk of cancer. The shortest

[d] **California Center for Health Statistics.** *California life expectancy, data matters.* Report No. 83-01031, July 1983.

[e] **Department of Health Services, State of California.** *Hypertension and related problems in California,* August 1982.

Table 4: **Comparison of increasing height and decreasing life expectancy in various groups**

Group	Reduction in life expectancy with increasing height (years/cm)[a]	% taller males versus females	% shorter male life expectancy[a]
Averages for Stini's statistics on 21 countries	—[b]	7.3	–7.5
Californian Whites (females versus males)	0.47	9.0	–9.1
Californian Asians (females versus males)	0.55	7.8	–7.7
Californian Hispanics (females versus males)	0.55	8.5	–9.3
Californian Blacks (females versus males)	0.63	8.7	–11.7[c]
VA Medical Center, shorter versus taller males (average height: 169.4 cm versus 180.3 cm)[e]	0.47	6.4[d]	–6.9
Baseball players, shorter versus taller males (average height: 170.2 cm versus 180.3 cm)	0.35	4.5[d]	–4.4

[a] The life expectancy refers to that at birth, except for males versus males, where the numbers in this column are based on longer average life spans.
[b] Actual heights were not available for calculating this reduction.
[c] This excessive difference may be due to Black male life-style and environment.
[d] Males versus males.
[e] Heights are averages for ≤175.3 cm and >175.3 cm groups.

men had about 40% lower incidence of cancer from all causes than the tallest men. Short women also exhibited a lower incidence of cancer, especially breast cancer. Caloric requirements and metabolic rate (calories per kg per day) increased with height (*18*).

Accuracy of height and weight data

The most accurate results for the VA Medical Center study would have been obtained if the height and weight data for each subject had been available when they were aged 25–30 years of age. The heights of the subjects at death were possibly affected by contraction, so that they may have been shorter than the records show. For a 5-year age difference between men of height ≤175.3 cm and those of height >175.3 cm, the shorter group would be about 0.3 cm taller than their measured height. However, most of the heights were provided by the subjects themselves and probably represented their greatest lifetime heights, since studies show that men often report the heights that they were during youth and often quote their heights with shoes on (*19*).

Weight was also a factor that was probably affected by age, life-style, and nature of illnesses. Comparison of the weights of subjects of different heights agreed fairly closely with those given in U.S. government publications. However, individuals suffering from cancer or alcoholism probably reduced the average weight somewhat, while heart and liver disease may have increased the weights of others. The weights of patients were measured by the VA staff, but may not have been representative of their weight during the prime of life. Despite these limitations, the average weight found for the subjects was almost the same as the national average.

Lack of homogeneity can also significantly affect study results. Men from lower socioeconomic backgrounds have a 200% higher mortality rate than those from upper classes (*10*). Also, males from upper socioeconomic classes are 2.54–5.08 cm taller, lighter for their heights, and smoke less. These factors were probably not significant in skewing the results of the present study because most people who die in VA hospitals are not well-off financially.

Despite having similar BMIs, taller men were lighter in proportion to their heights than shorter men. For example, men of height ≤175.3 had an average weight of 66.4 kg, compared with an average of 75 kg for men of height >175.3 cm. However, if the taller men had been proportionally bigger in all dimensions (e.g., 6.5% taller, wider and deeper), their weight would have been 80 kg. This relation-

ship has been shown to be true for successive generations of young Americans (*20–22*)[f] and is known as the *H*-cubed law (where *H* is height, and is similar to the now rarely used ponderal index = height/(weight)$^{1/3}$). The reason for a lower weight in proportion to height among our study population may be that men who increase their weight to match the *H*-cubed law die sooner. Alternatively, a biological law may be in effect that gradually converts the human configuration into a linear-type build as height increases. In either case, the life span of taller men is increased because of this lower weight, as shown in Table 2.

Conclusions

The data provided in this article support the entropy theory of aging, which hypothesizes that increasing human size is in conflict with a maximum life span. Because of the diversity of the deceased populations that have been studied in this connection, we feel that sufficient evidence is available to conclude that smaller size is preferable for better human health and increased longevity. However, small size caused by malnutrition, childhood illnesses, or other harmful environmental factors will not promote better health and longevity.

Of course, height and weight are only two of the factors that play a role in determining longevity. Other factors include low weight-for-height, good nutrition, genetic factors, stress management, wholesome life-style, regular exercise, higher socioeconomic status, good social and marital relationships, and good quality medical care.

The thesis that "smaller is better" is difficult to accept in view of the conventional wisdom that the opposite is true. Additional research which minimizes socioeconomic and other confounding factors is needed in this area.

[f] *Weight and height of adults 18–74 years of age. U.S. 1971–1974.* Washington, DC, U.S. Department of Health, Education, and Welfare, May 1979, p. 35 (DHEW PHS 79-1659).

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Résumé

Influence de la taille et du poids sur la longévité

Une étude ayant porté sur 373 hommes décédés au Veterans Administration Medical Center de San Diego (Californie, Etats-Unis) révèle qu'une taille et un poids élevés sont liés de façon significative à une réduction de la longévité. En moyenne, dans ce groupe, les hommes de petite taille (≤175,3 cm) ont vécu 5 ans de plus que les hommes de grande taille (>175,3 cm), tandis que ceux qui pesaient moins de 63,6 kg ont vécu 7,7 ans de plus que ceux qui pesaient plus de 90,9 kg. Le rapport entre la taille et le poids d'un certain nombre de joueurs de base-ball a également été étudié à des fins de comparaison. La réduction de la longévité observée chez ces joueurs en fonction de la taille et du poids est tout à fait comparable aux résultats obtenus à San Diego. Parmi les joueurs d'une taille donnée, une différence de 4,55 kg en moins se traduisait par un allongement d'environ un an de la durée de vie. Ce résultat concorde avec ceux d'autres études montrant que, pour une taille donnée, les individus plus légers ont un taux de mortalité inférieur.

Très peu d'études ont été faites sur des populations décédées pour déterminer les effets de la taille et du poids sur la longévité. Toutefois, une étude récente ayant porté sur 1679 hommes et femmes décédés à Cleveland (Ohio, Etats-Unis) a montré que les hommes et les femmes de petite taille vivaient plus longtemps que les autres, tandis que les hommes et les femmes de même taille avaient une longévité comparable. Cette étude a montré aussi que la longévité était inversement liée à la taille, à raison de 0,47 an/cm, alors que la présente étude donne 0,51 an/cm.

Les statistiques sur l'espérance de vie en Californie montrent aussi que les membres des groupes ethniques de petite taille, comme les asiatiques et les hispano-américains, vivent plus longtemps que les populations blanches et noires, qui sont de plus grande taille. Par exemple, les femmes asiatiques (taille moyenne: 156,7 cm; poids: 53,6 kg) vivent en moyenne 86 ans, contre 78,4 ans pour les femmes de race blanche (taille moyenne: 163,7 cm; poids: 62,7 kg).

Des études chez l'animal ont également montré que les espèces les plus petites, chez les chiens, les chevaux et les éléphants, tendent à vivre plus longtemps. D'autre part, les animaux

soumis à un régime alimentaire équilibré mais frugal sont plus petits et vivent également plus longtemps. Ces constatations semblent confirmer la théorie qui lie le vieillissement à une augmentation de l'entropie et qui prédit qu'une réduction de la masse et de l'apport énergique doit entraîner une plus grande longévité. (Il est cependant évident que le poids corporel et la consommation de nourriture ne doivent pas tomber au dessous du niveau nécessaire au bon fonctionnement de l'organisme et à la santé).

Les résultats de plusieurs études effectuées par des compagnies d'assurance sont contradictoires, des taux de mortalité plus faibles étant observés tantôt pour les hommes grands, tantôt pour les hommes petits. D'autre part, la "Build Study" de 1979 donne des taux de mortalité plus élevés chez les femmes de grande taille que chez celles de petite taille. Nous croyons cependant que ces études sont biaisées, car elles comparent des hommes grands et minces à des hommes petits et corpulents; or les hommes sont plutôt de type ectomorphe et leur poids n'augmente pas comme le cube de la taille. D'autre part, les personnes de petite taille appartiennent souvent à des groupes socio-économiques défavorisés qui ont des taux de mortalité beaucoup plus élevés (dus peut-être au tabagisme, à l'excès de poids, à des soins médicaux de moins bonne qualité et à d'autres facteurs).

Une comparaison des différences de taille et d'espérance de vie entre les hommes et les femmes dans divers pays a montré qu'en moyenne les hommes avaient une espérance de vie plus faible de 7,5% et une taille plus élevée de 7,3%. Il est certain que des facteurs liés aux processus biochimiques, au métabolisme et au style de vie expliquent en partie la plus grande longévité des femmes, mais le rapprochement entre ces deux chiffres et les autres données citées dans le présent article nous incitent à penser que la taille joue aussi un rôle significatif.

Les données que nous avons recueillies montrent que des hommes grands et corpulents peuvent vivre jusqu'à un âge avancé (80 à 90 ans), mais moins souvent que des hommes plus petits. Les hommes grands peuvent améliorer leur espérance de vie en surveillant leur poids, en s'abstenant de fumer et en adoptant un style de vie plus sain.

En conclusion, on peut dire que les hommes petits et minces vivent plus longtemps que les hommes grands et corpulents issus de milieux comparables et ayant le même style de vie. La longévité est inversement proportionnelle à la taille et au poids.

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