

CULTURAL INFLUENCES ON THE MANIFESTATION OF PSYCHOSOMATIC DISEASE? AN EXAMINATION OF MORTALITY STATISTICS

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ABSTRACT

Data showing the differing rates of cancer (all types), heart attack, and stomach cancer for American and Japanese men and women are reviewed. It is proposed that culture can affect the manifestation of disease in two ways — by dictating how the people within that culture handle their emotions and by possibly focusing attention on a particular part of the anatomy. Traditionally Americans have focused on the heart and are encouraged to express emotion while Japanese have focused on the stomach and have traditionally been encouraged to suppress emotion. Statistics show that though Japan has had one of the world's highest rates of stomach cancer, this rate is decreasing. Though, undoubtedly, changing dietary habits and more intensive early detection programs can explain part of this trend, it is suggested that changes in emotional responding may also be having an effect. It is proposed that the more open expression of emotions may be contributing to the rapid increase in the number of heart patients and to the rise in deaths from heart attack. Also discussed is the possibility that the increased consumption of meat may possibly be affecting mood resulting in increased aggressiveness with this also contributing to the increasing rate of heart problems.

INTRODUCTION

Up until quite recently, a tradition of dualism has held sway in the Western scientific world. According to this dualism, physiologists had as their domain the study of the body and psychologists had the study of the mind. This has been the accepted view of the disciplines for many years. However, recent advances in our understanding of the brain have undercut this long held view. Where many Western scholars once viewed the mind and body as separate, we now know the two to be closely interdependent. The psychologists of today study both the mind and the body and the interaction of the two.

This paper will address one of the possible aspects of this interaction — the question of whether *culture* can, to some extent, exert an influence on the manifestation of psychosomatic disease. That is, can the particular culture in which one is raised and

lives determine what area of the body is likely to be affected when the individual is under stress?

PROPOSAL

It is proposed that cultural influence can manifest itself in two different ways. First of all, the culture may determine how the individuals in that culture *handle their emotions*. For example, Americans are encouraged to openly express their emotions whereas Japanese have traditionally been encouraged to suppress outward expressions of emotion, at least in formal social settings. Secondly, it is proposed that this cultural influence may work through cultural tradition to *focus attention on one particular part of the body*. It is suggested that this focusing of attention may, to some extent, predispose the individual toward developing psychosomatic dysfunction in that area as opposed to another part of the body.

One question which has been quite puzzling to the current author for some 15 years is the fact that Japan has one of the world's highest rates of stomach cancer. This author has been alert these years for any information which might contribute to an explanation of this phenomenon. There is certainly research to implicate diet, but this appears to be only a partial explanation. In addition, the role of diet is an extremely complex one. This complex role will be discussed later in this paper when considering the interaction between diet and character. Put briefly, what we eat may influence our emotional behavior not only by affecting the neurotransmitters in the brain, but also possibly through its effect on physiological functions such as blood pressure, heart rate, metabolism and the levels of cholesterol in the blood.

Another fact which aroused this author's interest was the high rate of heart attack in the U.S., especially in conjunction with the fact that American males die from heart attacks at twice the rate of women. While preparing a lecture on stress, the thought occurred that the high heart attack rates in the U.S. and the high stomach cancer rates in Japan might be related to the way in which the two cultures handle their emotions as well as to specific cultural expectations.

If one compares American and Japanese people, one of the clear differences is that Americans more freely express their emotions, including anger, whereas there is a strong tendency in the past in Japan not to express emotions in public. In order to better understand the implications of this cultural difference in the expression of emotion, I would like to review a hardwired set of physiological reactions to danger known as the "Fight or Flight Response." The implications of this reaction for modern man will be discussed, and we will then consider the effect of long-term, chronic stress on the body and the effect of chronic stress on the immune system. Evidence will then be presented from research done in the U.S. which shows how different types of personalities may predispose one to death either by heart attack or by cancer. Mortality statistics for heart attack and cancer for the two countries will then be reviewed, and the implications of the statistics will be considered.

“THE FIGHT OR FLIGHT RESPONSE”

All organisms are equipped with a series of automatically determined physiological reactions which occur when the organism is confronted with danger or stressors. Let us consider the cave man sitting by a campfire eating his dinner when a lion attacks. Upon perceiving the lion, the cave man's body automatically reacts by diverting blood away from the periphery of the body and the gastrointestinal tract and by sending it to the head and trunk. Digestion suddenly stops as blood is diverted to provide energy to run or to fight. The heart and pulse accelerate, respiration becomes shallow, and his pupils dilate to let in as much light as possible. Sweat suddenly appears on his hands and feet and the flexor muscles in his legs contract and extensors are inhibited. All these automatic reactions are initiated by the sympathetic nervous system and are intended to help the organism react automatically in dangerous situations.

When this cave man was subjected to stress, he responded by fighting or by running away. Animals react to stress in the same way — by fighting or by fleeing. Herein lies the problem — our cave man of yesterday or today's animals can deal with the majority of their stressors by running away or fighting. We modern humans often cannot. Much of the stress we experience cannot be handled by fighting or running away although our first impulse may be to do one or the other. In our complex society with its refined codes of acceptable behavior, fighting or fleeing are often not considered appropriate reactions to stressful events (Pelletier, 1977, p. 69). When someone's boss informs him that he has to work on the weekend he had planned and paid for a nonrefundable ski trip, that person cannot physically attack the boss, nor can he run away. This modern human must muster his resources, respond in a polite way, and suppress the emotional distress. Unfortunately despite the person's outer calm, the body enters into a state of stress preparedness much like that of the cave man of yesteryear. Messages are relayed throughout the endocrine system which cause wide-spread changes in the body's chemistry. When an animal has acted by fighting or running away, its neurophysiological stress response subsides, and its body rebounds into a state of deep relaxation and from there ultimately back to a state of homeostasis. However, humans may often have no socially acceptable action to take and the physiological state of stress preparedness continues unabated (Pelletier, 1977, p. 69). Man's ability to worry about the future as well as the past mean that he may experience prolonged stress-induced physiological arousal. The important question to be asked is “What are the effects of this prolonged stress?”

HOW PROLONGED STRESS LEADS TO DISEASE

If a stress-induced state of physiological arousal continues unabated, the biochemical changes associated with it may prove to be detrimental to health. For example, sustained stress results in substantially increased hydrochloric acid secretion as well as a decrease in the number of eosinophil cells which are important in the body's immune response. These cells protect the body by engulfing invading alien particles/organisms. Research has shown that the number of these cells is significantly depleted in the blood

of cancer patients (Amkraut & Solomon, 1975). Pelletier has pointed out that when a machine is overworked, the weakest part breaks down first. It is the same with the human body — the weakest link in the chain of vital physiological processes will succumb first. Such factors as heredity, environment, general health habits, behavioral variables, and past illnesses may all play a role in determining whether illness will occur as a result of prolonged stress (Pelletier, 1977).

It should be noted that stressors are not only things that cause worry, anxiety, or strain. One is also under stress every time you are required to adapt or readjust to personal, social, and environmental influences. Adolph Meyer, a professor of psychiatry at Johns Hopkins, was one of the first people to link life events, excessive stress, and disease. He kept life charts on his patients and noticed that illness tended to happen at times when clusters of major events occurred in peoples' lives within a fairly short period of time (Meyer, 1951).

The Department of Health, Education, and Welfare's Epidemiology Center in Atlanta has collected medical statistics to show that during a recent economic recession, there was a marked increase in peptic ulcers, heart attacks, impotence, weight loss, and other psychosomatic disorders. Clinicians have frequently noted that the incidence of psychosomatic disorders among patients moves higher as the Dow Jones Average moves downward (Pelletier 1977, p. 86).

A number of research studies using animals have shown that such variables as the stress of overcrowding, noise levels, and electrical shock can increase an animal's susceptibility to cancerous disorders and viral infection (Andervont, 1944 ; Blaney, 1985 ; Riley, 1975 ; Sklar & Anisman, 1981). Considerable experimental data both involving humans and animals have shown that stress and emotional distress suppress the function of the immune system (Solomon, 1969). There is also considerable data which links stress, failure of psychological defenses, and personality factors to the onset and course of cancer (Greene & Miller, 1958 ; LeShan, 1961 ; Tarlau & Smalheiser, 1951).

PERSONALITY AND ILLNESS

TYPE A BEHAVIOR & CARDIOVASCULAR DISORDERS

Some of the most important work done in the area of personality and cardiovascular disorders was done by Friedman and Rosenman (1974). These researchers report that one of the earliest clues to the relationship between personality and cardiac disorders came from the man who reupholstered the chairs in the offices of these heart specialists. This man commented that the chairs their clients sat in were worn only on the front edges — it was as if they were sitting in tense expectation. Another clue came from a study of dietary cholesterol with a group of couples. In this study, the women suffered significantly less heart disease when compared with their husbands. Dietary and cholesterol factors were thought not to be able to explain this difference as the eating habits of the husbands and wives were presumably identical. Female hormonal

differences were not felt to be responsible for this difference since Caucasian women in other countries were reported to have rates of heart disease as high as those of men. Also at the time their study was done, black women in the U.S. were slightly more susceptible to heart disease than black men. If sex hormones were responsible for the difference found, then the hormones of the women in their study had to be biochemically different from those of other women. One of the women in the study told the researchers that she knew what was causing the greater number of heart attacks of the men — STRESS. This became the beginning of the study of the Type A personality (Friedman & Rosenman, 1971).

These researchers went on to fully investigate this phenomenon. They hypothesized that the remarkably high occurrence of Type A behavior in the U.S. was due to the influence of the Puritan Ethic as well as to the American economic system which emphasizes the acquisition of material wealth, achievement, and competition. According to the authors, American society has institutionalized and glorified these traits. They go on to state, that, in fact, typical Type A behavior is generally revered as the Type A man often has the generally admired traits of ambition, drive, and the desire to acquire the material trappings of success. They suggest that there are two traits in particular which define the Type A personality. The first is excessive competitive drive and the second, a chronic sense of time urgency coupled with a feeling that deadlines must always be met. They also note that Type A people exhibit much more easily elicited hostility and that they are typically extroverted and aggressive. When Friedman and Rosenman studied the neurophysiological profile of the classic Type A's, they found that serum-cholesterol levels appeared to vary directly with the intensity of the Type A behavior pattern. They also found that subjects exhibiting Type A behavior were found to have every blood fat and hormone abnormality that the majority of coronary patients studied showed. That is, the same abnormalities that many physicians believe precede and possibly bring on coronary heart disease (Friedman & Rosenman, 1974). Based on their research, Friedman & Rosenman concluded that personality attributes can over time affect the cardiovascular system and actively predispose an individual toward coronary disease.

PERSONALITY AND EMOTIONS IN CANCER

A number of studies have shown that psychological and emotional factors can influence neurophysiological functioning and adversely affect an organism's immunological responsiveness. Not only can depressed immunological responsiveness leave the organism susceptible to viral infections, it can also lead to conditions where the growth of cancerous tumors and mutant cells is allowed to proceed unchecked by the body's normal defense mechanisms. As Pelletier as pointed out, the question which arises is "What are the specific psychological and emotional patterns which precede the development of cancer? (Pelletier, 1977)" Research in the West seems to point to a fairly well-defined emotional and psychological complex which appears consistently among cancer patients. First of all, patients who developed cancer were found to have

had a difficult childhood and to have developed a personality which was constantly trying to please others (Greene & Miller, 1958 ; Klopfer, 1957 ; LeShan, 1961). In adulthood, they were frequently described by friends as exceptionally fine, thoughtful, gentle, uncomplaining people, and almost 'too good to be true (LeShan and Worthington, 1956 quoted in Pelletier, 1977).' The research shows that these people bottled up and suppressed feelings of hostility. Although the evolution of this type of personality is quite different, the resulting personality is quite similar to that often encountered in Japan where traditionally both men and women have been expected to suppress their hostility, to not openly display their true feelings, and to keep things bottled up inside.

As early as 537 B.C. the ancient physician Galen observed that melancholy women were more likely to suffer from cancer than sanguine (cheerful, confident, optimistic, vigorous) women (Sklar & Anisman, 1981). Kowal of Boston University examined the contributions of eighteenth and nineteenth century American physicians to the relationship between emotions and cancer and found that many of these physicians were impressed by the frequency with which certain life events tended to occur prior to the development of cancer (Kowal, 1955). Bacon, Rennecker, and Cutler (1952) have noted that "modern cancer investigators believe that everyone carries the cancer potential within him and that it is simply a matter of whether you die of something else before you die of cancer." Suppression of the immune system by stress and psychological distress may allow the emergence of cancer earlier in life in some than in others.

Blumberg, West & Ellis (1954) studied the growth rate of cancer in a group of men. Their research conclusion was that intense emotional stress can significantly increase the growth rate of an existing cancer. LeShan and Worthington (1956) studied the carcinogenic personality and found several factors that differentiated cancer patients in the study from the control group. Two of the factors that differentiated the two groups were that the cancer patients had experienced a lost relationship prior to the diagnosis of the cancer and also that they found it difficult to express hostility in their own defense. In a 1967 study of lung cancer patients, Kissen found that their subjects typically had "poor outlets for emotional discharge." Kissen felt that this factor was quite important, as it suggested that the specific life event in the person's life might not be as important as the person's reaction to that occurrence (Kissen, 1967).

STRESS AND CULTURE

As mentioned previously, the body has a prewired set of physiological responses which occur when the person is under stress. Factors such as past injuries or illnesses, lifestyle, environment, heredity, and other behavioral variables may interact to determine what organ will be affected. I would like to give several examples of the way in which culture can affect the manifestation of psychosomatic illness.

Simmons (1950) reported a case involving the Hopi Indians in the Western part of the U.S. It is a traditional belief of the Hopi that if one walks on the tracks of a snake, that person's ankles will begin to hurt. To avoid this, the person must ask the help of the tribal medicine man who will perform certain rites to make sure that the pain

never develops, or that if it does, that it will disappear. In one family reported by Simmons, the son had been educated and had abandoned the traditional Hopi beliefs. He had moved into the larger American culture and had no respect for the authority and effectiveness of the Hopi medicine man. Despite this, the son did develop sore ankles when he walked on a snake's tracks. In this case, the culture dictated the area where psychosomatic symptoms would occur.

Another example concerns what was until recently the French national pathology called "crise de foie" or the liver crisis. The French do, in fact, have the highest rates of cirrhosis of the liver in the world. As Payer (1988) has pointed out, they also are acutely aware of their livers and both French patients and their doctors attribute an extremely wide variety of bodily complaints to their livers. The list of complaints attributed to the liver includes among others migraine headache, painful menstruation, paleness, yellowness, general fatigue, acne, rash, dandruff, herpes, tonsillitis, laziness in children, motion sickness, low blood pressure, insomnia, faints, etc. Payer goes on to point out that in 1976, 12 percent of French drugs were for the digestive system as compared with 5 percent of U.S. drugs. Interestingly enough a dramatic shift occurred in cultural thinking in 1976 when French hepatologists held a press conference and absolved the liver of its responsibility for most diseases, and since then it has been unfashionable to talk about the "crise de foie." Payer (1988) points out that statistics show that between 1970 and 1980 the number of persons saying that they suffered from liver disease declined by a factor of four and the sale of drugs for the liver also dropped dramatically. This cultural emphasis on the liver is closely tied up with the belief by the French that eating rich food causes liver problems. A Princeton University student noted in her thesis examining the "crise de foie" that "The 'crise de foie' reinforces the social significance of the act of eating and drinking in France. It signifies the superior quality of the French meal, and the pride the French feel in that high quality (Payer, 1988, p. 58)."

Sime, Rossi, and Lubbers (1990) found cross-cultural differences in physical and emotional responses to stressors when studying stress-related disorders among American and Brazilian men and women. Americans reported a significantly higher incidence of allergies and irritable bowel syndrome while Brazilians reported a higher incidence of Raynaud's syndrome (the major manifestation of which is cold hands/feet).

Dewaraja and Sasaki (1991) report that the cultural beliefs of Sri Lanka associate semen loss with illness, anxiety, and loss of energy and power; this type of belief is not shared by the Japanese. The researchers found that 35 nonpsychotic patients attending a psychiatric clinic in Sri Lanka during one month attributed their complaints of sexual dysfunction, lethargy, thinness, and miscellaneous aches and pains to semen loss resulting from masturbation or nocturnal emissions. The researchers found that similar complaints are quite rare among psychiatric patients in Japan.

Clarke, Salmons, and Harrison (1988) studied three female Asian migrants to the United Kingdom who presented with vomiting which was not of organic origin. They

found that culture had significantly influenced the adoption of vomiting as a manifestation of distress.

Each of these examples demonstrates how cultural beliefs or customs can predispose the individual to develop psychosomatic symptoms or physical ailments in one area as opposed to another. In France, it is the liver ; in America, the heart, and in Japan, it may be the stomach.

Let us now return to the high rate of stomach cancer in Japan and the relatively high rate of heart attack in the U.S., especially among men. As Fig. 1 shows, Japan has the highest rate of stomach cancer of the countries shown and certainly one of the world's highest rates. Complete figures for all the countries of the world are not available, but it can be seen that Japan's rates are significantly higher than several other Asian countries (i.e. Philippines, Thailand) whose diets are presumably more similar than the diets of Western countries. Before considering the most often suggested factor of diet, let us consider the traditional Japanese focus on the "hara" (stomach) as the seat of many spiritual qualities.

Table I contains a list of "hara" expressions. In Japan the stomach is seen as the focus of courage, true motives, as a vital body center, and is given many of the properties that Americans attribute to the heart. These Japanese expressions link the stomach with generosity, selfishness, tolerance, decisiveness, disloyalty, anger, conscience, stoicism, shallow thinking, sincerity, tolerance, etc.

Americans, on the other hand, have few expressions using the word stomach, but focus instead on the heart as the seat of many of the feelings just mentioned. Table II is a list of "heart" expressions with their literal translations and the cultural equivalent expression in Japanese. This emphasis on the heart in connection with emotional distress has had a long history in the Judeo-Christian world. Mumford (1992) performed a systematic search of the Hebrew Bible for expressions of emotional distress and found that somatic expressions referring to the heart were common. When one compares the stomach cancer and heart attack rates of the two countries, the disparity is clear. As can be seen, America had almost five times the number of heart attacks that Japan had for the years shown. By contrast, Japan's stomach cancer rate was four times that of America (Fig. 2).

WHAT DO THE STATISTICS TELL US

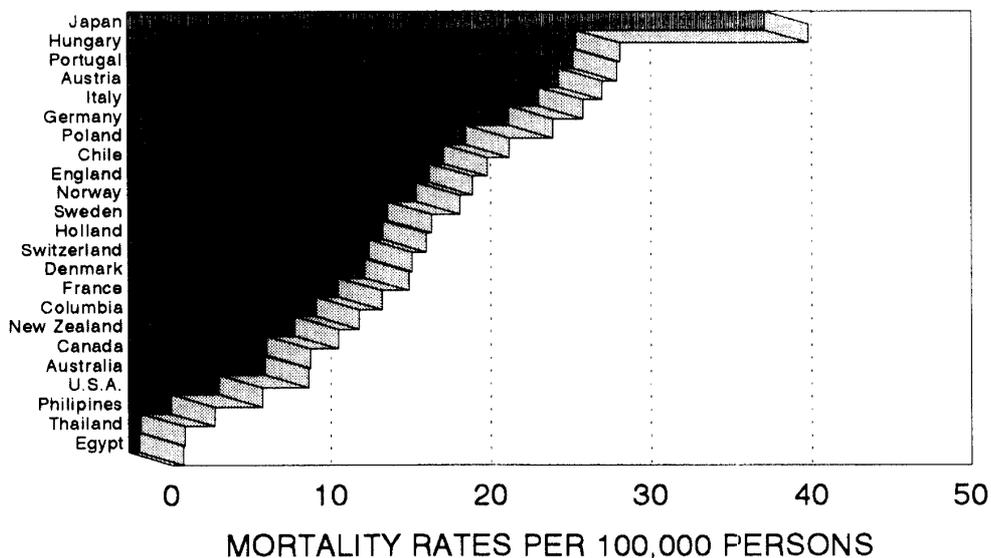
In order to further investigate the issue of the role of stress and cultural influence, let us look at the rates of heart attack and stomach cancer for American and Japanese men and women.

HEART ATTACKS IN THE U.S. — MALES vs. FEMALES

As mentioned earlier, the research of Friedman and Rosenman (1974) showed that women in America had lower heart attack rates than their husbands though the couples in the study ate the same diet. What do the overall statistics show for men and women in the U.S.? Fig. 3a & 3b¹ which are based on data from 1986 show that the

difference between men and women in the U.S. begins at about the time that males enter society (Fig. 3b). Men can be seen to have higher rates of heart attack than women for all age ranges except the 75 to 84 age range. This is very interesting in light

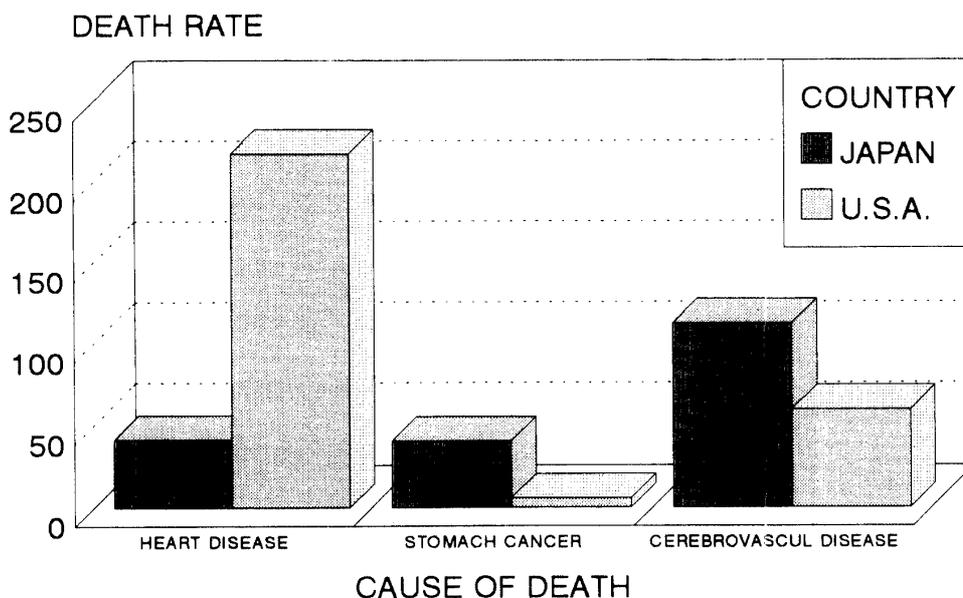
COUNTRY



SOURCE: p. 408, Table 15, Trends in National Health, Ministry of Health and Welfare Statistical Association, 1989.

Note: years for data differ by country (range 1977 - 1987)

Fig. 1 STOMACH CANCER RATES FOR SELECTED COUNTRIES



SOURCE: p. 820, fig. 1407, Statistical Abstract of the United States, 109th Edition, U.S. Department of Commerce, Bureau of the Census, 1989.

(Age-standardized death rate per 100,000 population; data for Japan 1986, U.S. 1984)

Fig. 2 DEATH RATES IN JAPAN & AMERICA FROM ISCHEMIC HEART DISEASE, STOMACH CANCER, and CEREBROVASCULAR DISEASE

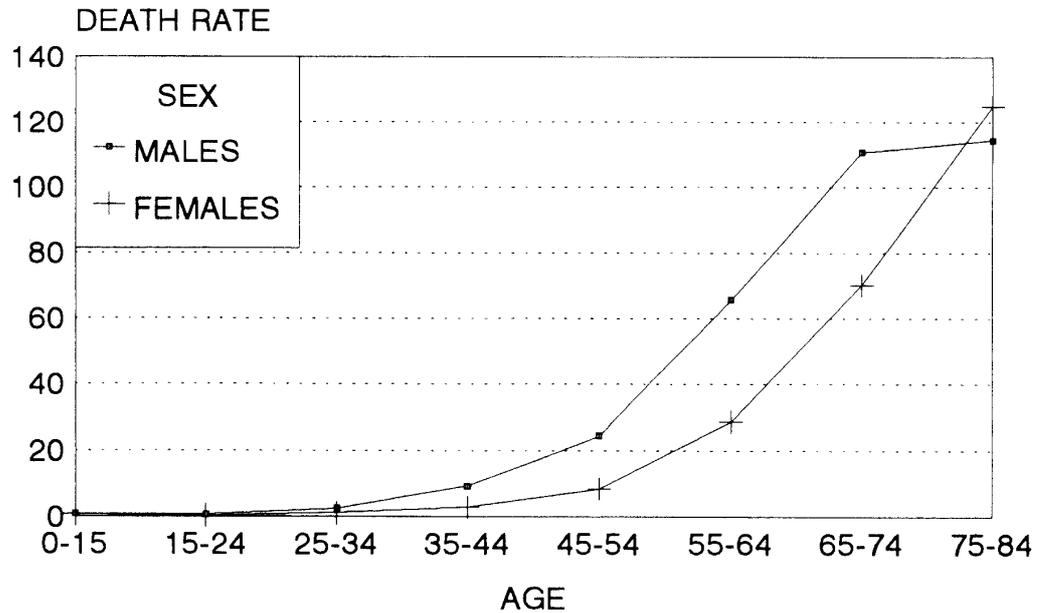
Table 1 VOCABULARY LIST OF “HARA” EXPRESSIONS

HARA LANGUAGE	LITERAL TRANSLATION	CULTURAL TRANSLATION
腹 hara	belly, abdomen, stomach	heart, courage, vital body center, real intentions, true motives
腹の大きい人 hara no okii hito	a man of big hara	a generous person, a big-hearted person, usually a man with charisma
腹の小さい人 hara no chiisai hito	a man of small hara	a selfish person, overly cautious and unfor- giving
腹の出来た人 hara no dekita hito	a man of developed hara	an ego-free (self-effacing) person, a tolerant (disciplined) person
腹の座った人 hara no suwatta hito	a man of sedate hara	an irresolute man, a sedate man
腹の黒い人 hara no kuroi hito	a man of black hara	a scheming person
腹で考える hara de kangaeru	think with hara	hara -think, think extra-logically, think uncalculatingly
腹の中を見せない hara no naka o misenai	not showing the inside of one's hara	not revealing one's true motives or showing one's cards
腹の探りあい hara no saguriai	feel each other's hara	feel each other out, feel each other's pulse
腹に治める hara ni osameru	keep something in one's hara	keep something to oneself
腹が立つ hara ga tatsu	hara stands up	get angry
腹も立たない hara mo tatanai	even hara does not stand up	it's beyond indignation
腹に聞く hara ni kiku	listen to one's hara	follow one's conscience
腹を練る hara o neru	train one's hara	try to gain imperturbability
腹の練れていない人 hara no nerete inai hito	a man with untrained hara	a shallow thinker without experience
腹を決める hara o kimeru	make up one's hara	make up one's mind once and for all
腹を据える hara o sueru	set one's hara	brace oneself, be prepared
腹を割る hara o waru	slit open one's hara	get things off one's chest
腹を見せる hara o miseru	show one's hara	show sincerity
腹を割って話す hara o watte hanasu	open one's hara & talk	let it all hang out, talk things over without reserve
腹を読む hara o yomu	read one's hara	read one's mind
痛くもない腹を探る itakumonai hara o saguru	having one's hara treated when it feels no pain	be unjustly suspected
腹に一物ある hara ni ichimotsu aru	having something in one's hara	have an axe to grind
腹に据えかねる hara ni suekaneru	cannot put something in one's hara	cannot put up with, cannot stomach (an insult)
腹を括る hara o kukuru	fasten one's hara	burn one's bridges
腹の虫が治まらない hara no mushi ga osamaranai	stomach worms cannot be pacified	cannot control one's feelings
腹の太い hara no futoi or futtoppara na	having a fat hara	forgiving or tolerant

from *The Unspoken Way HARAGEI : Silence in Japanese Business and Society* ; by Michihiro Matsumoto, Kodansha International, Tokyo & New York, 1988.

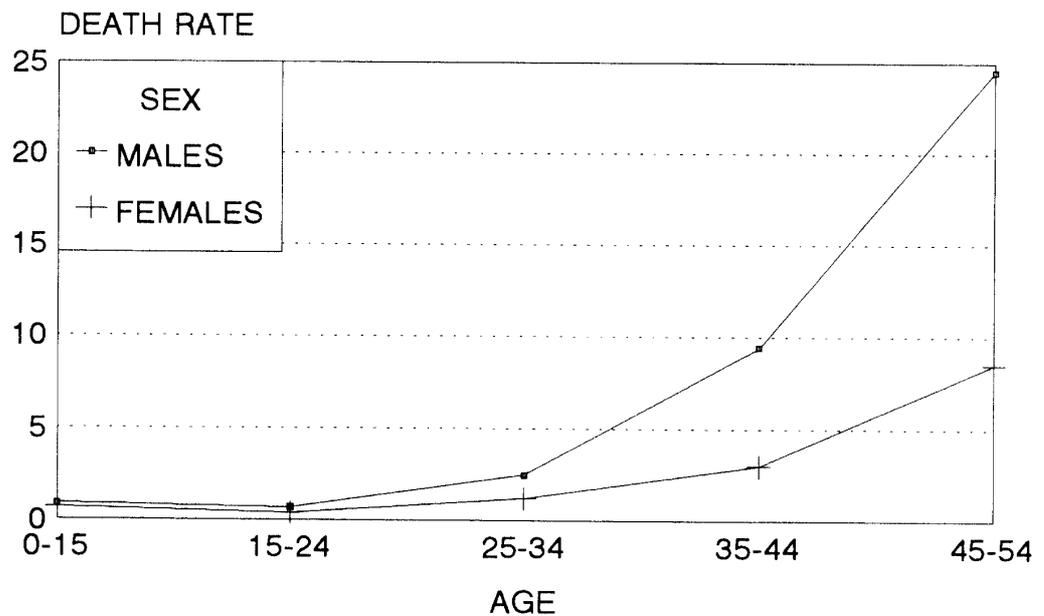
Table II VOCABULARY LIST OF "HEART" EXPRESSIONS USED IN AMERICA

HEART LANGUAGE	LITERAL TRANSLATION	CULTURAL TRANSLATION
heart	心	feelings, courage, spirit, essence, memory, mind
a warm-hearted person	暖かいところ	親切な人
a heart of gold	金の心	やさしい心
a hard heart	堅い心	冷酷な心、融通のきかない
to move the heart	心を動かす	感動する
from one's heart	心から	衷 心から
with a light heart	軽い心で	心も軽く、気軽 <small>きがる</small> に
with all one's heart	心の全部で	心を尽くして、誠心誠意
with a heavy heart	重い心で	重苦しい気持ち
to set one's heart at ease	安心する	ほっとする
heart sinks in my boots	心が長靴まで沈む	がっかりする
my heart leapt into my mouth	心が口に飛び込んだ	私はびっくり仰天した 大変意外なことでした
not a bad man at heart	心は悪い人ではない	根は悪い人ではない
break one's heart	心を壊す、心が痛む	悲嘆 <small>かなしみ</small> に暮れる
to cry one's heart out	心を尽くして泣く	胸が張り裂ける程泣く
to do one's heart good	心を良くする、心地よい	いい気持ちにする、喜ばせる
to eat one's heart out	心を食へ出す、心を蝕む	気に病んで苦しむ、心を痛める
have the matter very much at heart	そのことを大変心にかけています	心に深くとどめる
to have the heart in the right place	心は適当な所にある	やさしい心を持っている
to have the heart to do	何かをやるための心を持つ	する勇気がある
heart and soul	心と魂	熱心に、身も心も打ち込んで、全力をあげて
to set one's heart on	心を何かに付ける	を欲 <small>ほ</small> しがる、切望 <small>せつぼう</small> する
to be sick at heart	心が病気になる	心を痛めている、心が病む
to take to heart	心に入れる	深く心に刻む
to take heart	心を掴む	勇気を出す
to lose heart	心を失う、気をなくす	がっかりする
have a heart to heart talk	心と心で話す	腹を割って話す、腹藏 <small>ふくざう</small> なく話す
don't have the heart to	(何かをやる) 心がない	勇気がない
to keep a good heart	良い心を保つ、気分よく	勇気をなくさない、やる気がある
to put heart into a person	人の心に入れる	人を元気付ける
to have one's heart in one's work	仕事に心を持つ	仕事に熱中する
with half a heart	心を半分で	しぶしぶ、いやいやながら、気が向かない
wear one's heart on one's sleeve	心を袖で着る	思うことをあけすけに言う、包み隠さず
black hearted	黒い心を持つ	腹黒い、よこしまな、裏表 <small>うらおもて</small> のある
has no heart	心がない	無慈悲な、思いやりのない
a change of heart	心の変化	気を変える
after one's own heart	心の目指すところ	人の望みをかなえてやる、思い通りに
near to one's heart	核心に近い	大切である
to one's heart's content	心の満足ゆくまで	完全な満足まで、お気に召すまま
to hearten	元気づける	活を入れる
false-hearted	嘘の心	裏切りの
heart-burn	心焼け	胸焼け
heart-felt	心に感じた	心からの、深く心に感じた
heartless	心のない	不人情な、勇気のない、無慈悲 <small>むじひら</small> な
heartily	心を尽くして	心から、腹一杯(食べる)
heartly	心からの	盛んな(食欲)、心からの



SOURCE: p. 79, fig. 118, Statistical Abstract of the United States, 109th Edition, U.S. Department of Commerce, Bureau of the Census, 1989. (figures in thousands)

Fig. 3a DEATH RATES IN U.S.A. FROM ISCHEMIC HEART DISEASE IN 1986 BY AGE & SEX (Ages 0-84)



SOURCE: p. 79, fig. 118, Statistical Abstract of the United States, 109th Edition, U.S. Department of Commerce, Bureau of the Census, 1989. (figures in thousands)

Fig. 3b DEATH RATES IN U.S.A. FROM ISCHEMIC HEART DISEASE IN 1986 BY AGE & SEX (Ages 0-54)

of the fact that Friedman and Rosenman have noted that there often exists no difference between men and women in other countries. In addition, at the time of their study black women in the U.S. had slightly higher rates of heart attack than black men. This fact argues against an explanation of the difference in terms of different hormonal influences.

HEART DISEASE IN JAPAN — MALES vs. FEMALES

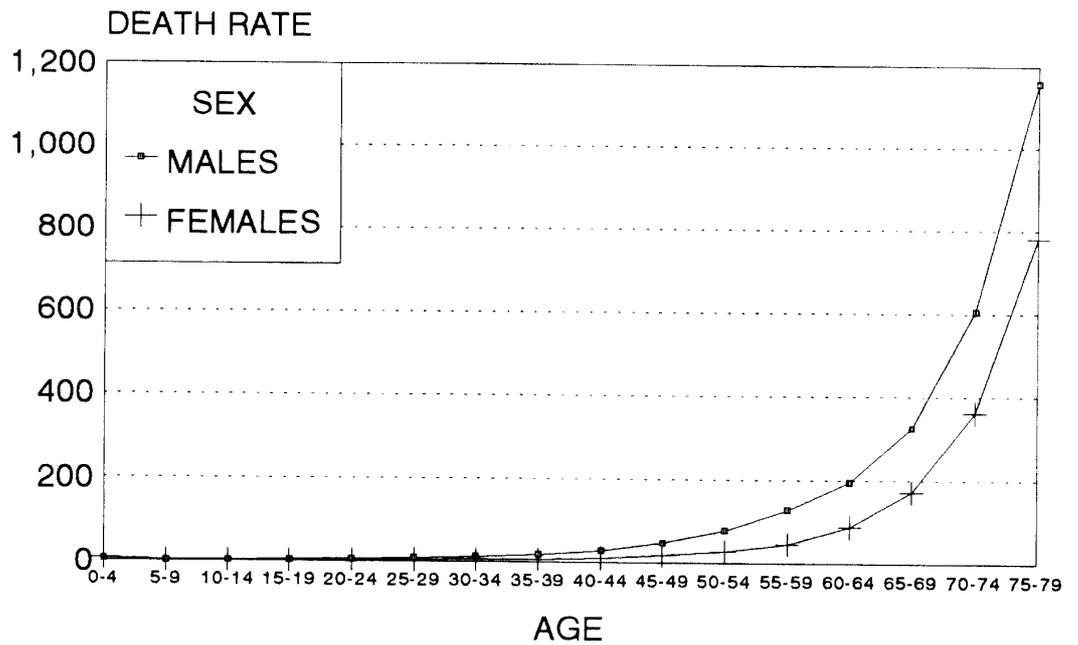
If it is indeed stress which may be contributing to the higher rates of heart attack among men, then Japanese men would presumably have higher rates of heart attack than Japanese women as we can postulate higher stress for men because of the pressures of the work place. We might also postulate this on the basis of the relatively freer expression of emotion allowed Japanese men when compared with women. As can be seen Japanese men have higher rates of heart attack from age 15 up until age 79 (Fig. 4a & 4b).

U.S. RATES FOR ALL TYPES OF CANCER --- MALES vs. FEMALES

As in Japan, there is an expectation in America that women will less readily express their anger in public, but will, instead, keep it better under control than men. Men are generally expected to suppress emotions other than anger. For example, open mourning is not as acceptable for men as it is for women. What do the overall statistics for cancer among Americans reflect? As Fig. 5a & 5b show, the pattern does not appear to be a consistent one. Rates are about equal for men and women until age 34. Between age 34 and 54, the rate for all types of cancer for women is slightly higher than that of men. However, from the age of 54 on, men have significantly higher rates until the 80's. One might speculate that American women experience more stress than men during the time in life when they start to show signs of aging and at the time their children often leave home (around age 40). For men, this greater stress may occur relatively later as they approach retirement.

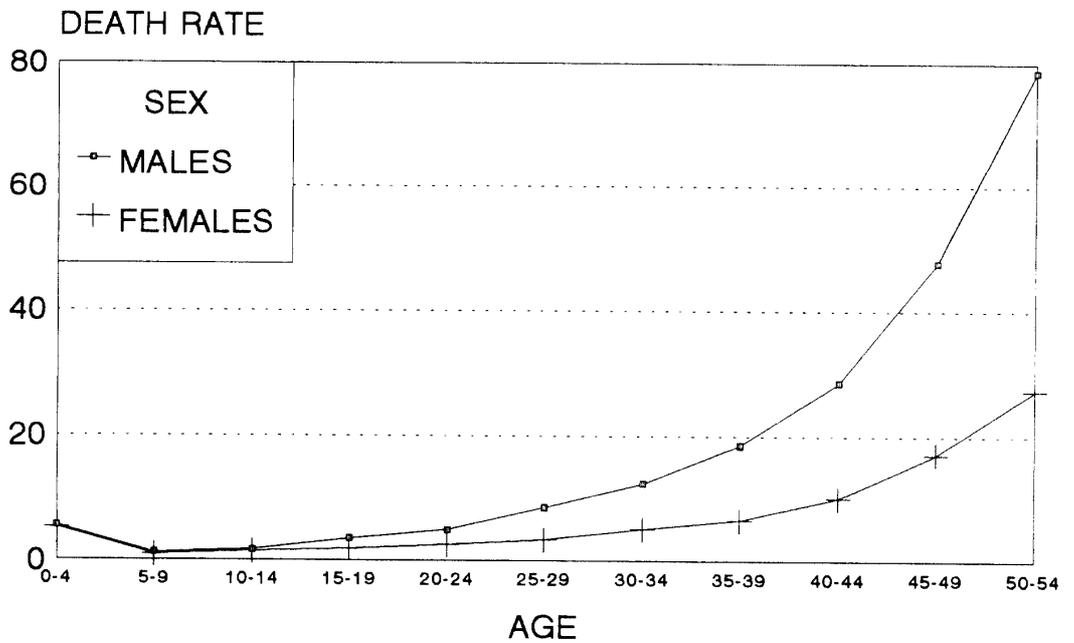
JAPANESE RATES FOR ALL TYPES OF CANCER — MALES vs. FEMALES

What type of cancer rate distribution would one expect for Japan? Culturally women are expected to keep their emotions under tight control. Unlike American women in the past, most Japanese women control the family finances and they also have almost total responsibility for educating and raising the children. Due to the size of the numbers, the graph has been compressed and the trend cannot be clearly seen by looking only at the figure (Fig. 6a & 6b). However, if we look at the original data, it is clear that although Japanese women have slightly higher rates of cancer between the ages of 30 and 44, men and women in Japan have relatively equal rates of cancer until age 44. A dramatic increase in the rates of cancer for men occurs at about age 45 and the male rate remains double or more the rate for women until the 80's. It is interesting to note the slightly higher rates of cancer for Japanese women between the ages 30 and 44 (Fig. 6b), these being the child bearing and child rearing years when the Japanese



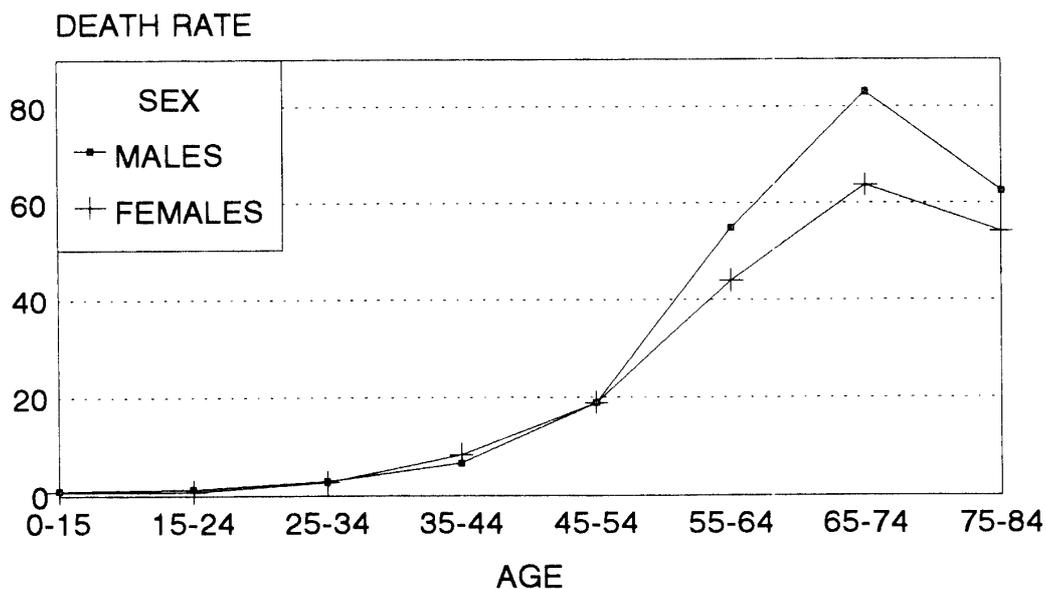
SOURCE: p.382-393, Table 7, Trends in National Health (Kokumin eisei no doukou), Ministry of Health & Welfare Statistical Association (Kousei toukei kyokai), 1989. (figures are per 100,000)

Fig. 4a JAPANESE MORTALITY RATES FOR HEART ATTACK BY AGE & SEX IN 1989 (Ages 0-79)



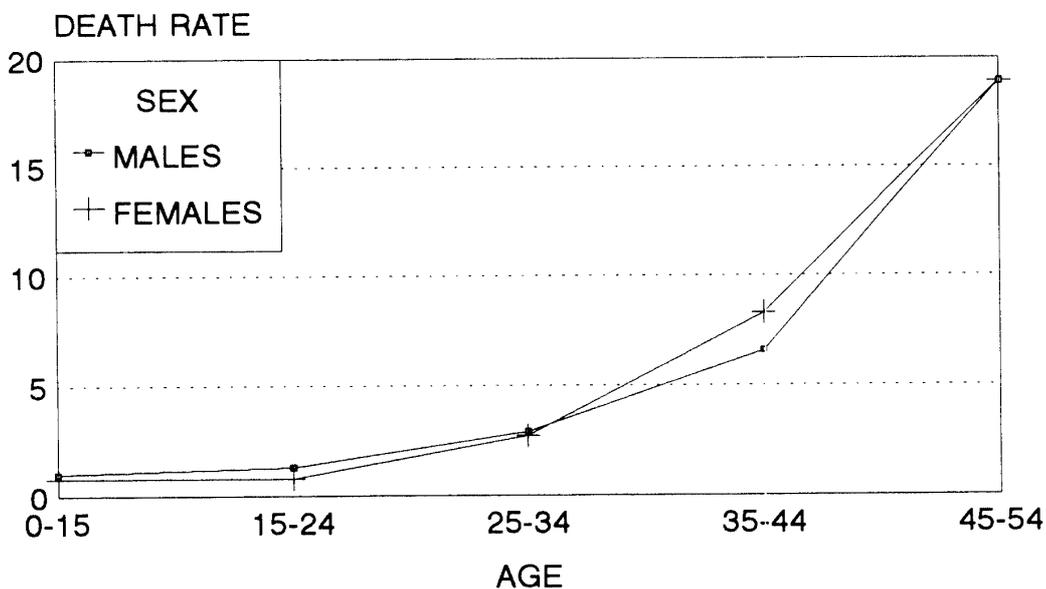
SOURCE: p. 382-393, Table 7, Trends in National Health (Kokumin eisei no doukou), Ministry of Health & Welfare Statistical Association (Kousei toukei kyokai), 1989. (figures are per 100,000)

Fig. 4b JAPANESE MORTALITY RATES FOR HEART ATTACK BY AGE & SEX IN 1989 (Ages 0-54)



SOURCE: p. 79, fig. 118, Statistical Abstract of the United States, 109th Edition, U.S. Department of Commerce, Bureau of the Census, 1989. (figures in thousands)

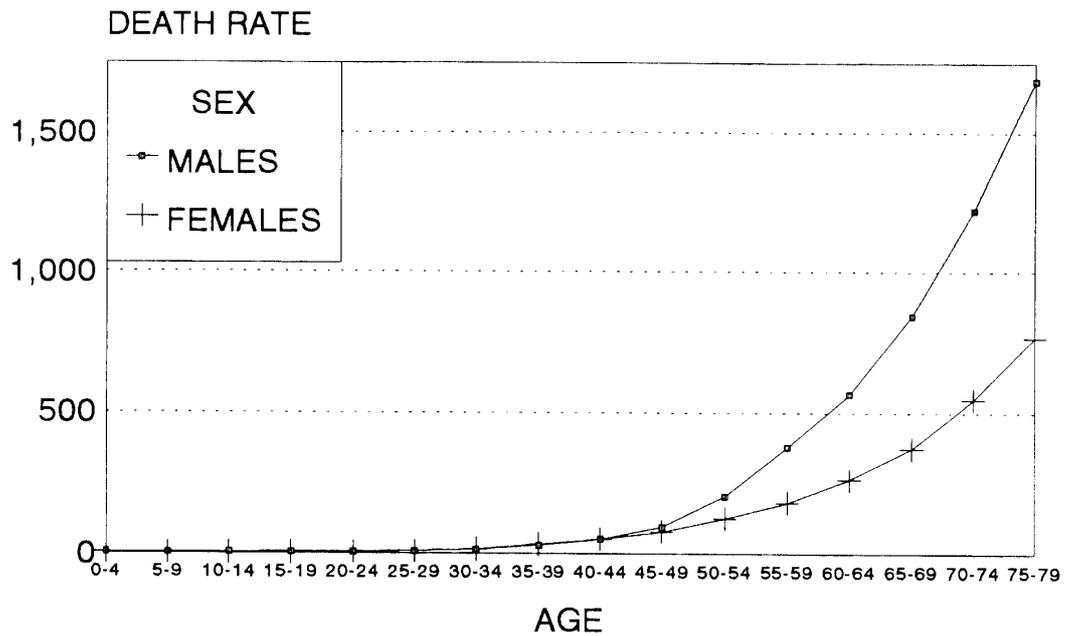
Fig. 5a DEATH RATES IN U.S.A. FROM CANCER IN 1986 BY AGE & SEX (Ages 0-84)



SOURCE: p. 79, fig. 118, Statistical Abstract of the United States, 109th Edition, U.S. Department of Commerce, Bureau of the Census, 1989. (figures in thousands)

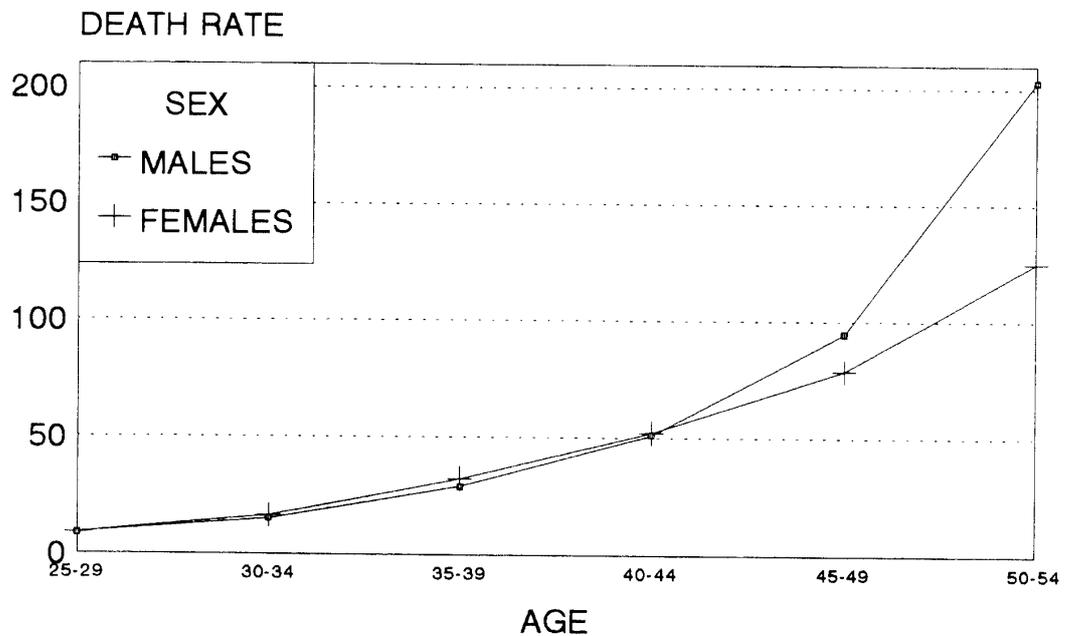
Fig. 5b DEATH RATES IN U.S.A. FROM CANCER IN 1986 BY AGE & SEX (Ages 0-54)

mother has almost full responsibility for the home, finances, and the rearing and education of the children, in other words, the years of greatest stress for women. The dramatic increase in male cancer rates from age 45 would suggest a considerable increase in stress around this time, presumably the age at which company responsibil-



SOURCE: p. 382-393, Table 7, Trends in National Health (Kokumin eisei no doukou), Ministry of Health & Welfare Statistical Association (Kousei toukei kyokai), 1989. (figures are per 100,000)

Fig. 6a JAPANESE MORTALITY RATES FOR ALL CANCERS BY AGE & SEX IN 1989 (Ages 0-79)



SOURCE: p. 382-393, Table 7, Trends in National Health (Kokumin eisei no doukou), Ministry of Health & Welfare Statistical Association (Kousei toukei kyokai), 1989. (figures are per 100,000)

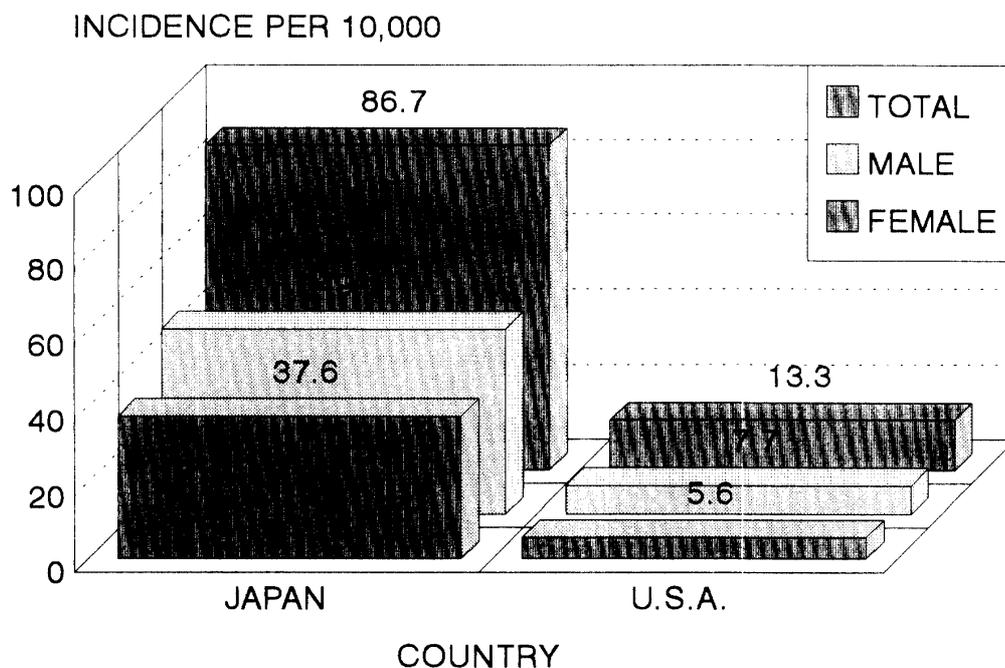
Fig. 6b JAPANESE MORTALITY RATES FOR ALL CANCERS BY AGE & SEX IN 1989 (Ages 25-54)

ity becomes heavier. In later years, the stress may take the form of loss of identity due to retirement and separation from the company. After retirement, the husband may feel purposeless as he returns to the domain of the home where his wife has had total control.

STOMACH CANCER RATES IN JAPAN & U.S. — MALES vs. FEMALES

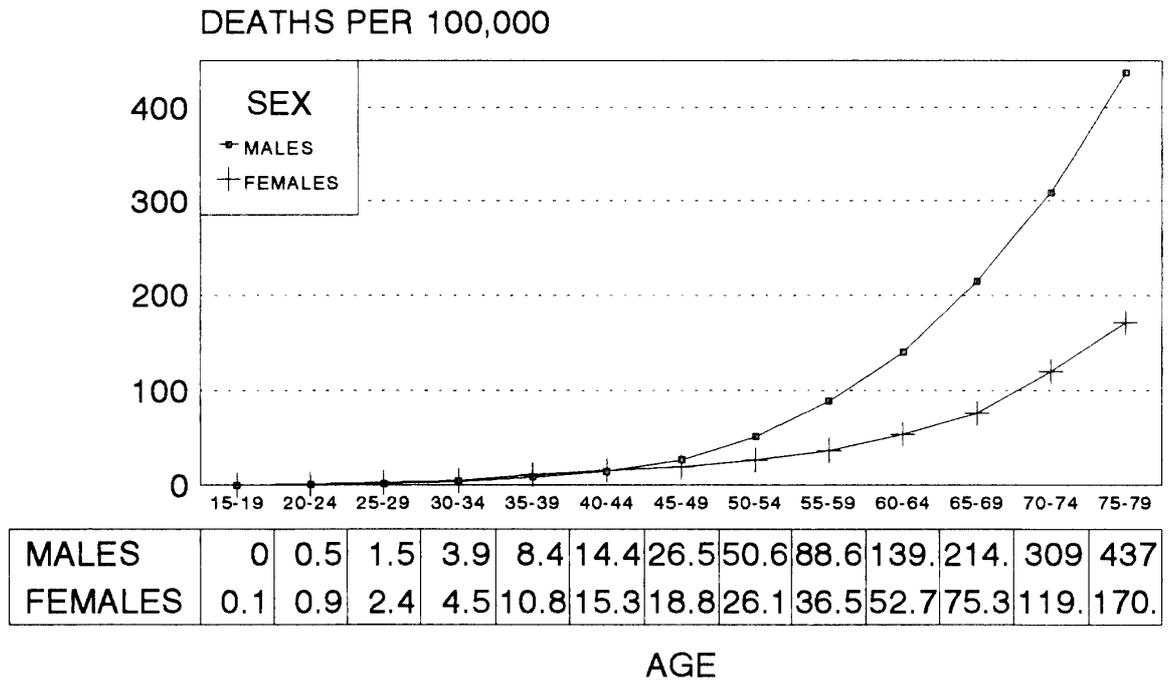
We have considered the statistics for all types of cancer. What do the statistics tell us about stomach cancer? Fig. 7 is based on data from a 1963 study which investigated stomach cancer in Japanese and American males and females. As can be seen, Japan's stomach cancer rates were found to be much higher for both males and females when compared with the U.S. When the data is compressed across all age groups, both Japanese and American males have higher rates than their female counterparts.

In Fig. 8a & 8b data on mortality rates for stomach cancer are presented for Japanese males and females. The trend seen is quite similar to that seen in the figure showing rates for all forms of cancer. From age 15 to 44, Japanese women have slightly higher stomach cancer rates than men. From age 45, rates of stomach cancer for men begin to increase substantially and by age 50 to 54 rates for men are *double* those of women and remain double or more across the rest of the life span. This rapid increase beginning around age 45 is interesting in light of research done by Daiichi Seiyaku, a major pharmaceutical company (*Japan Times*, 1991). Daiichi Seiyaku surveyed 500 male executives listed with the Tokyo Stock Exchange and found that 70% of the section heads (課長), men in their prime, suffered stomach troubles. Of these 50% were



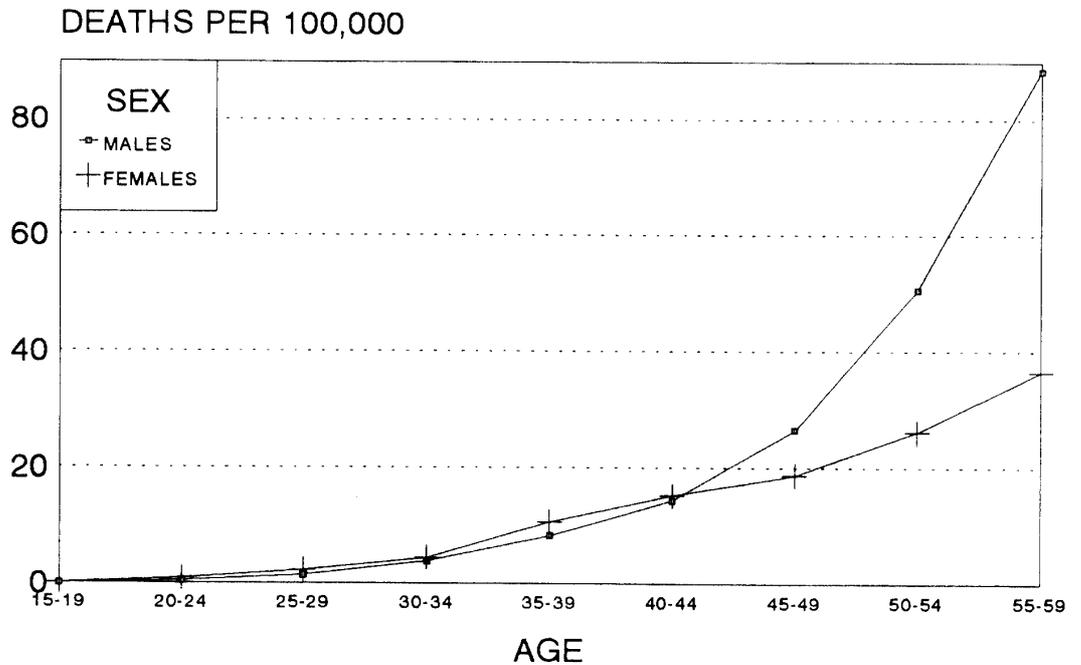
SOURCE: 1963 study cited in Table I, p. 43, M. Kushi, *Cancer and Heart Disease*, Japan Publications, Inc., 1982.

Fig. 7 STOMACH CANCER IN AMERICAN AND JAPANESE POPULATIONS



SOURCE: p. 382-393, Table 7, Trends in National Health (Kokumin eisei no doukou), Ministry of Health & Welfare Statistical Association (Kousei toukei kyokai), 1989.

Fig. 8a JAPANESE MORTALITY RATES FOR STOMACH CANCER BY AGE & SEX IN 1989 (Ages 15 to 79)



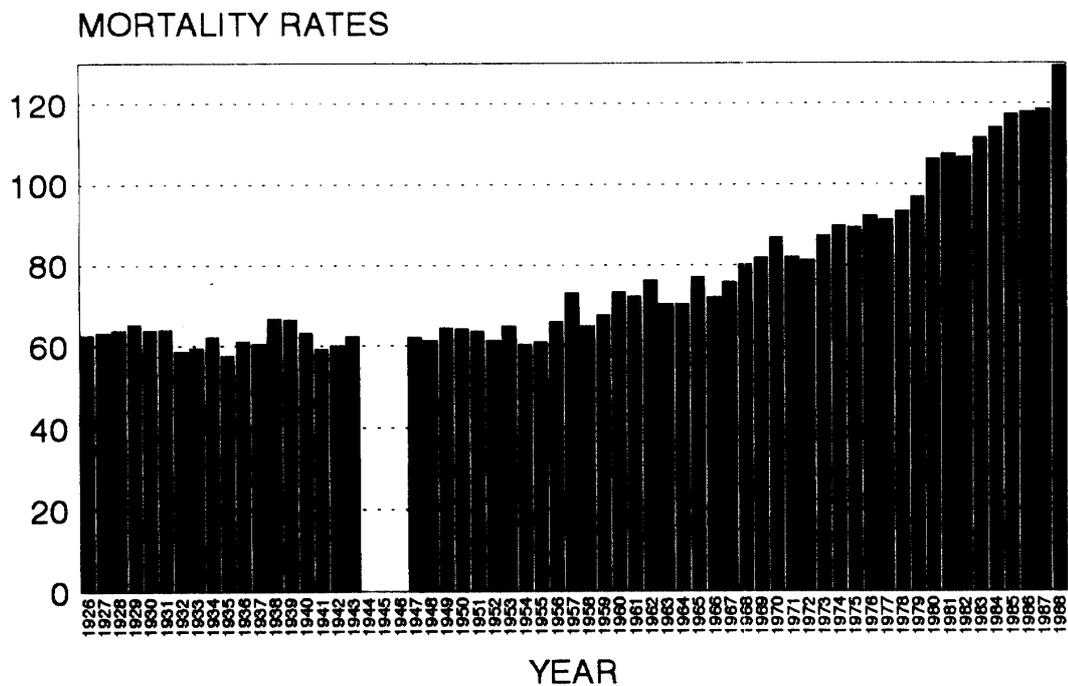
SOURCE: p. 382-393, Table 7, Trends in National Health (Kokumin eisei no doukou), Ministry of Health & Welfare Statistical Association (Kousei toukei kyokai), 1989.

Fig. 8b JAPANESE MORTALITY RATES FOR STOMACH CANCER BY AGE & SEX IN 1989 (AGES 15 TO 59)

being treated by a doctor. Of the 500, 55.8% had consulted a doctor at one time or another for acute stomach inflammation or acid stomach. Of these 500, 53.8% feared contracting stomach cancer.

DISCUSSION

The intention of the current paper has been to gather evidence to suggest future possible areas of research. There are a number of questions which arise which can be investigated more rigorously. Among these are the following : 1) Can cultural conditioning and expectation, in fact, predispose an individual to develop psychosomatically related illness in one particular area of the body as opposed to another? 2) We have evidence to suggest that the way in which an individual in America handles his or her stress may predispose that person to develop cancer as opposed to having a heart attack. Can we look at the same problem on a broader level and postulate that the way in which cultures dictate that emotions are to be handled may have an affect on how the citizens of those countries manifest stress related disease. 3) The third question which arises is the relationship between diet, the expression of emotion, and disease. As can be seen from Fig. 9, deaths due to heart disease have been increasing rapidly in Japan since about 1959. To say that this increase in heart disease has been caused by the changing diet of the Japanese people is not a simple statement because what we eat affects our mood and character. As mentioned before, what we eat can affect emotions directly by altering the neurotransmitters in the brain. What we eat can also



SOURCE: p. 380, Trends in National Health (Kokumin eisei no doukou), Ministry of Health and Welfare Statistical Association (Kousei toukei kyokai), 1989. (Figures represent rates per 100,000; data not available for 1944, 1945, 1946)

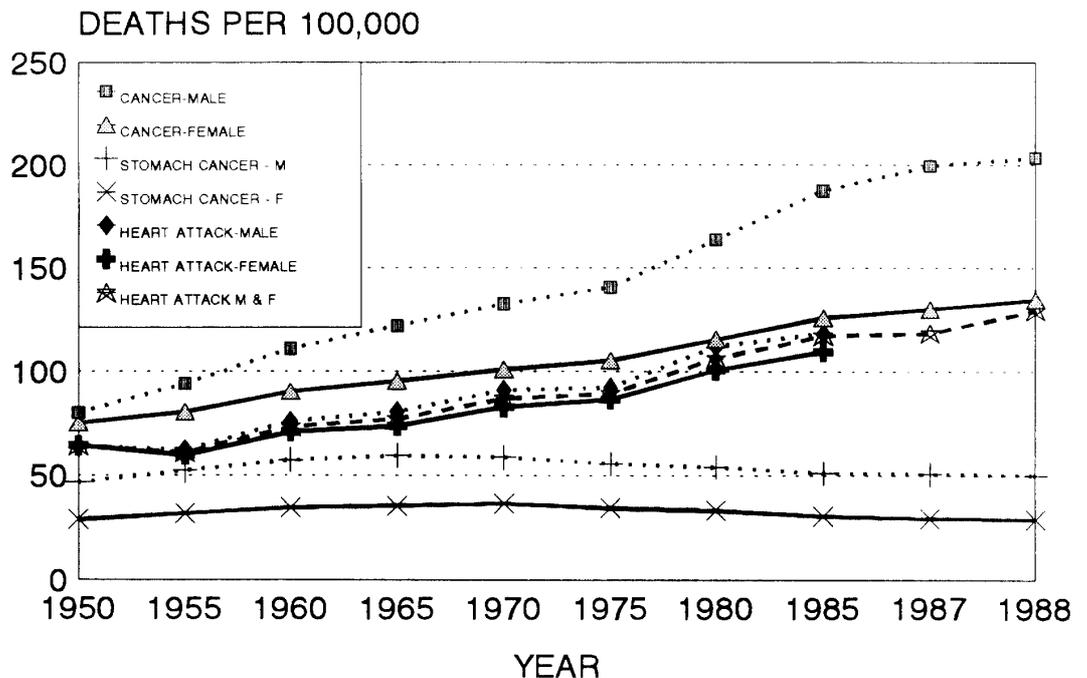
Fig. 9 JAPANESE MORTALITY RATES FOR HEART ATTACK (1926 to 1988)

affect emotions indirectly through its effects on metabolism, blood sugar levels, or through rises in body temperature, blood pressure, etc. As a simple example, think how much more easily one gets irritated when one is too hot or how irritable we can become when blood sugar levels are low.

Space does not allow an in-depth consideration of the relationship between diet and emotions, but please consider the following phenomena. Buddhist temples in the past forbade users of meat and alcohol entrance to the temples. Also interesting is that many of the passive hippies in America in the 1960's gave up eating meat and became vegetarians. When one considers the animal kingdom, it is clear that most of the meat eaters are aggressive, while the vegetarians are primarily peaceful. If we continue this same line of thinking, we must ask whether the increase in meat consumption in Japan is not only contributing to higher heart attack rates by increasing the levels of cholesterol, but also whether the changing diet is increasing heart attack rates by increasing aggressiveness in those with high meat consumption. Certainly the theaters, T.V. programs, and video stores are full of many examples of violence.

Government data (Fig. 10) suggests that rates for all types of cancer combined have been rising steadily. Fig. 10 also shows that stomach cancer rates have been steadily declining both for men and women since 1965. The question which arises in this regard is whether this is due to better detection, to changing diets, or perhaps, in part, to a societal trend toward greater expression of emotion.

An article in the *Asahi Shimbun* in November of 1990 (Asahi Shimbun, 1990) stated

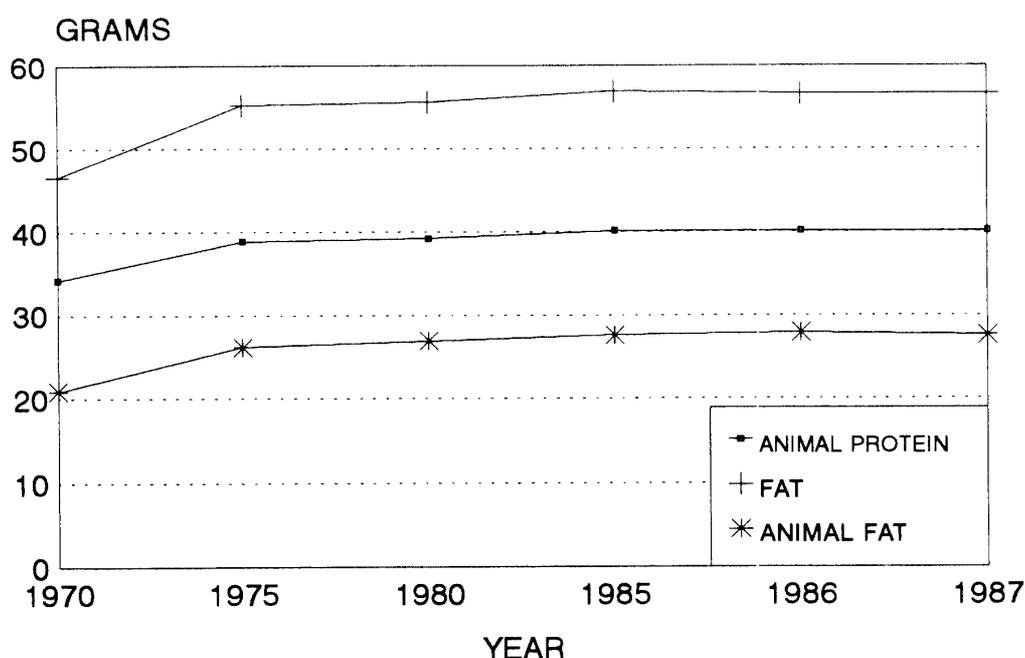


SOURCE: Cancer data from p. 70, Table 34, Health and Welfare Statistics in Japan, Health and Welfare Statistics Association, 1990; heart attack data from p. 151, Vital Statistics 1984 Japan (Jinkou douai toukei), Ministry of Health and Welfare, 1984.

Fig. 10 TRENDS OF DEATH RATES IN JAPAN BY LEADING CAUSE OF DEATH

that there has been a five fold increase in heart patients from 1970 to 1990. According to this article, in 1970 there were 500,000 Japanese being treated for heart disease whereas there were 2,400,000 heart patients reported in 1990. A committee (心臓病予防制圧対策研究委員会) studying this phenomenal increase in the number of patients being treated for heart problems attributed the increase to three factors : a) an unbalanced diet including high salt intake, high caloric intake, and high fat intake, b) lack of exercise, and c) excess stress. Interestingly enough, available data show that animal fat consumption has actually remained steady since 1975 (Fig. 11). Though according to Health and Welfare Ministry statistics, animal fat consumption (and presumably cholesterol) has not increased, deaths from heart disease have continued to climb dramatically (Fig. 9 & 10). Thus, diet, at least in terms of animal fat, would appear to be only part of what is contributing to Japan's rapidly increasing heart disease rates.

Needless to say, the effects of diet, cancer, heart attack, and mood are intricately intertwined. It is interesting to note that research by Haenszel and Kurihara in 1968 (Kushi, 1982) with Japanese immigrants found that after three generations of the new environment and new dietary habits, the rates of stomach cancer adjusted to American levels. Most likely heart attack rates for Japanese immigrants also begin to conform to American standards. In the end, however, differences cannot be explained by diet alone for along with dietary habits, immigrants adopt societal values and goals and ways of responding to stress which may predispose them to death by one cause rather than another.



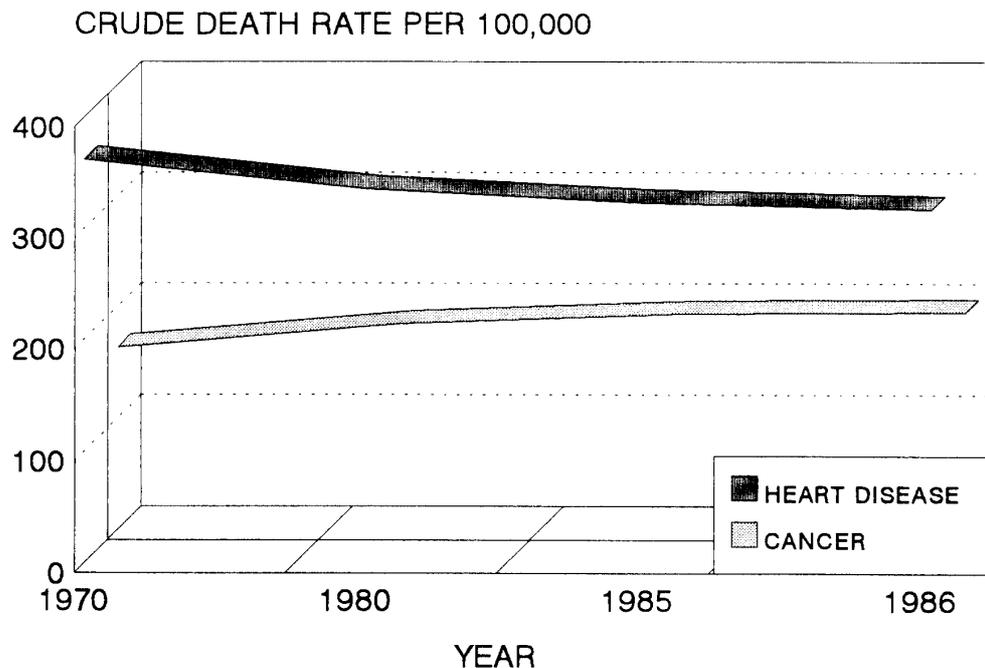
Source: p. 61, *Health and Welfare Statistics in Japan*, Health and Welfare Statistics Association, 1990.

Fig. 11 AVERAGE INTAKE OF NUTRIENTS PER CAPITA PER DAY IN JAPAN (1970-1987)

SUMMARY

Statistics have been reviewed to show that the U.S. has a much higher rate of heart attack than Japan whereas Japan has much higher rates of stomach cancer. It has been suggested that to say that these differences are caused by diet is too simple an explanation. Though diet is certainly important, it is suggested that the two cultures may be influencing mortality statistics in several ways. First of all, in the two cultures, citizens are encouraged to handle their emotions in very different ways. In Japan, there is greater suppression of emotions, whereas in America, there is greater expression of emotion. Research from America shows that Americans who develop cancer are often those who have developed a personality style which suppresses emotions. It is suggested that if we extrapolate this finding to a broader cultural level, it is possible that the American way of responding may predispose its citizens to heart attack, whereas the Japanese way of responding may predispose one to cancer. Statistics show that the number of Americans who die from heart disease is significantly higher than those dying from all types of cancer (Fig. 12). On the other hand, statistics show that Japan's mortality rates have always been higher for cancer, though deaths from heart disease are rapidly increasing (p. 49, Health and Welfare Statistics Association, 1990).

The current paper suggests that culture can have a second effect on mortality statistics in that cultural expectations can focus attention on specific parts of the body and that this particular area may possibly be thus predisposed to disease, psychosomatic or otherwise. In the case of Japan, there has traditionally been strong cultural emphasis on the stomach ("hara"). It is interesting to note that stomach cancer



SOURCE: p. 78, No. 117, *Statistical Abstract of the United States*, 109th Edition, U.S. Department of Commerce, Bureau of the Census, 1989.

Fig. 12 DEATH RATES FROM CANCER AND HEART DISEASE IN AMERICA : 1970 TO 1986

rates have been declining. Certainly diet is one factor, but anecdotal evidence indicates that Japanese young people focus far less attention on the stomach than in the past. For example, older Japanese report that younger Japanese rarely use “hara” expressions.

Japan is a rapidly changing society. This change not only includes changes in diet and the indirect effects of diet on mood, but also changes in behavior which evolve from changing social beliefs and expectations. It has been noted that complaints of liver-related problems declined considerably in France after a campaign to absolve the liver of responsibility for many totally unrelated maladies. Examination of Ministry of Health and Welfare data (Ministry of Health and Welfare, 1989, p. 396) listing the leading causes of death in Japan from 1920 to 1988 shows that in 1949, heart disease was the 7th leading cause of death. In 1952 it was the 6th, in 1954 the 5th. By 1955, it was the 4th; in 1958 the 3rd, and by 1985, heart disease was the 2nd leading cause of death. As Japanese society changes to aspire to the same things as American society, it will most likely acquire America's leading cause of death — heart attack. It may not be long before heart disease becomes Japan's number one killer.

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Footnotes

- Note : Figures "a" and "b" in this paper are based on identical data. The second figure ("b") has been redrawn with a more restricted age range to better show trends hidden by compression caused by larger values in older age groups