approximately $220 Billion on Medicare beneficiaries, the overwhelmingly majority of whom are elderly. The average amount per beneficiary is $5600 per year. Medicare consists of 2 basic components: Part A covers the costs of hospitalization, and Part - covers supplemental care - doctor's visits, medical supplies, and the like. Between the two, (Fig.5) Medicare spending is primarily for inpatient hospital expenses (40%); outpatient and physician care together come to 30% of the Medicare outlay, and very little goes to home health programs, skilled nursing facilities, or hospice (total 11%). The result is that most acute care is paid for, but little chronic care is covered.

Funding for Medicare is also more complicated than that for Social Security (Fig.6). Funding comes from payroll taxes (part A), general tax revenues (part B), user premiums (part B), and interest from investments. While Medicare is not the sole source of funds for health care for the elderly (nearly 60% have some other type of supplemental health plan, paid either by themselves or by their former employers), there are significant deductibles and co-payments that make out-of-pocket costs a problem for many older adults--the average outlay is $2,150 dollars, and uses up 20% of the income of the average older adult. These amounts vary somewhat by the type of health insurance, age, marital status, race/ethnicity, and a variety of other factors.

Medicare also has been increasing as a percent of the Gross Domestic Product (GDP) (Fig.7) and is projected to continue throughout the 21st Century. Unlike the increases in Social Security, however, these increases are due more to the unbridled expansion of the costs of medical care, not so much the numbers of beneficiaries. It is well known that the recent increases in the cost of Medicare have been due to factors other than increases in the number of beneficiaries, which has contributed less than a 1/4 of the increase (Fig.8). The bigger culprits have been our inability to control costs (67%) and the intensity of services (10%). Clearly the increases in the number of older adults in the 21st Century will exacerbate this trend, but it is also clear that getting a handle on the costs themselves will be critical.

Long Term Care

Federal outlays for long-term care (Fig.9) will also be rising dramatically in the 21st Century, from $123 Billion this year to $350 Billion in 2040 (in year 2000 dollars). This is in spite of the fact that a large portion of long-term care is currently borne by private families. (Fig.10). The two biggest payers of long-term care are the family (Donated Care-27%) and Medicaid (26% - largely nursing home care). Medicare picks up 17% (in short term post-hospital coverage), and individual older adults pay 25%. Currently, very little of the long term care costs are borne by Long Term Care Insurance but this is destined to change as more adults with long term care insurance reach the ages where such care is needed.

Trends in Health

Of course, virtually all of our projections regarding the cost of health care, both acute and chronic (or long-term) are based on what we know about current trends in the health of the elderly. There is pretty much a consensus that increasing life expectancy has resulted in longer life and better health, although the evidence is not consistent across different surveys or different conditions. If we consider measures that are most likely to affect our funding of Social Security, it is useful to examine reported work disability among adults. When my colleagues and I recently examined work disability among adults born

between the years of 1917 and 1959, we found that, indeed, for the older adults (cohorts born between 1916 and 1940), work disability steadily decreased for both men and women. Interestingly, this trend (1982-1993) makes a dramatic turn for those born 1946 and later - the baby boom, or tomorrow's older adults (Fig.11). This finding implies that future cohorts of older adults may not be able to continue working, just at a time when it might be important for them to do so, for their own financial well-being, and also for the continued solvency of Social Security.

If we examine the same age groups in relation to a number of chronic conditions, we find that in men (Table 1), there appear to be improvements in the prevalence of arthritis, cardiovascular disease, and emphysema for both today's and tomorrow's elderly cohorts. However, with musculoskeletal disorders, we find that while today's older adults have experienced no change over the time period examined, the future cohort of older adults has experienced increased rates; in addition, both current and future cohorts of older adults are experiencing increased prevalence of orthopedic impairments. These findings are largely the same for females - they also participate in continued decreasing rates of cardiovascular diseases and arthritis. For females, however, we find increases in asthma and orthopedic impairments only for future cohorts of elderly women.

Another point to make, in stark contrast to Japan, is the impact of the US' racially diverse population (Table 2). At the present time, non-Hispanic whites account for 84% of the US elderly population - by 2050, this percent is projected to be only 64%, with the highest amount of growth among the Asian & Pacific Islanders (a census grouping), followed by Hispanics, and African Americans. This is important because, in the US, Hispanics and African Americans are the least healthy, wealthy, and those most likely to be dependent on our social welfare programs, potentially complicating the projections we see for the overall population. For example (Fig.12), if we examine work disability rates among men, we see that rates of work disability for African American men are nearly twice that of Non-Hispanic White men, with Hispanic men falling in between the other two.

In terms of our projections for health, then, we see that in the future, our older adults may be subject to a remarkable increase in work disability, continued improvements in life-threatening diseases, but increases in conditions such as asthma, musculoskeletal and orthopedic disorders that my compromise both their continued ability to work, and their need to pay for, primarily, long-term care. In terms of their financial condition (Fig.13), an examination of the comparative income of adults aged 40 who were born in 1921-25, in 5 year cohorts, up to cohorts born between 1951 and 1955 shows another threatening trend. What we see is that each successive generation of 40 year old Americans has been better off than the previous cohorts, with a halt to this increase in the 1946-1950 cohorts and beyond - in other words, the baby boom. Even then, these figures mask differences between subpopulations, with the most affluent of the baby boomers continuing to have growth in their comparative income, and the least affluent losing ground.

Changes in Family Structure

While we consider these figures, and their impact on Social Security and Medicare, it is also critical that we keep in mind the potential problems that arise when considering the changes to family structure in the U.S. Due to increased longevity, adults will live longer in all of their relationships: whether as a parent, a child, a spouse, or

alone. Alternatively, in the US, we are seeing more and more cases of "serial monogamy," in which divorce and remarriage result less in being a spouse longer (my parents have just celebrated their 59th Anniversary), to having 1 spouse for the earlier part of life, another for midlife, and perhaps a third spouse with which to grow old. In any case, the general trend has been for the family to move away from a traditional "pyramidal" structure toward something more like a "beanpole" - (Fig.14) - here I present a photograph of 4 generations of women in my family - my mother, sister, her oldest daughter, and her daughter. In contrast, when I was in high school, all of my grandparents were deceased, so for several years, there were only 2 generations alive.

For adults in the US, the increase in 4-generation families has resulted in some unintended consequences. Increasingly, we see phenomena where adults in their 40s have aging parents (and sometimes grandparents) while they are struggling to raise their children; alternatively, for the adults in their 60s and 70s, we see increasing numbers who have frail parents, and whose retirement years are interrupted by the prospect of the divorced daughter moving in with her children. Thus, the burden of caring for frail older adults increasingly falls on fewer and fewer family members - usually women (donated care!).

Policy Choices

There are a number of changes to Social Security and Medicare that are currently being considered to cope with the projections we have discussed today. For Social Security, the changes include:

- reducing benefits (trim back benefit)
- increasing revenues
- privatization
- strengthening the economy

Politically, it would not be feasible to reduce benefits for those already receiving Social Security; what would be possible would be to reduce benefits for new retirees. Another way is to raise the retirement age, which is in process now, going from 65 in 2000 to 67 by the year 2025-moving the age further to 70 is currently being discussed. Finally, it would be fairly easy, but again, unpopular for the government to cut back on the Cost-Of-Living-Adjustments which ensure that those receiving Social Security are able to keep up with inflation.

Increasing revenues are even less popular. In order to meet the demands of Social Security, the current 6.2% in payroll tax (12.4% total) would be raised to 8.6%, an unlikely occurrence in today's political climate. Other options would be to raise other federal taxes or to cut other government expenditures, options that are also not likely in the foreseeable future, considering the makeup of the U.S. Congress.

Privatization would require the reduction of Social Security benefits, and the mandate that workers put some percentage of their earnings into individual retirement investment accounts. The main problem with privatization is that is tends to benefit those who are already able to put money away for retirement - not those who will really need Social Security to survive. The risk is that the system then becomes two-tiered, with one system for the affluent, and "welfare" for the rest. This would dramatically undermine the widespread political popularity of Social Security.

The real solution is to strengthen the economy. This can be done through a number of means, including finding incentives to increase capital accumulation (savings and investments), and to enhance productivity.

For Medicare, the most important and effective policy option would be one which I fear will never happen - Universal Health Care (UHC). Whether it is structured similarly to a Canadian plan, or on the U.K. model, or completely differently, UHC is the only way to bring down the cost of medical care insurance by including all in the risk pool. If President Clinton's 1994 attempt to reform our health care system tells us anything, however, it is that Americans are too satisfied with the system they have, for all its flaws. Therefore, attempts to reform the health care system will have to be incremental. The easiest method would be to reform health insurance coverage by a number of means:

- extending Medicare to cover the un- and under-insured
- including prescription drug benefits, and
- allowing people aged 55-64 to buy into Medicare voluntarily

The results of these reforms, however, are likely to increase costs at a time when we will be looking to reduce costs, instead. The efforts to control spending have largely centered on "managed care" - in our country, the Health Maintenance Organizations (HMOs), Preferred Provider Organizations (PPOs), and other attempts to limit the cap on medical spending. The good news is that, in 1998 and 1999, health care spending did slow down, suggesting that managed care can be effective in the short run.

In the long term, however, there are no readily available solutions. Current proposals include controlling prices and utilization -i.e., the continuation of managed care efforts to control costs; premium supports, and medical savings accounts. Premium supports would offer choices of care similar to those currently offered in extended-care facilities - if one chose to contract with a cheaper plan, they would receive fewer benefits, and vice versa. The government's involvement would be limited by a bidding system, in which local contractors would vie for the right to provide Medicare services. A system such as this might, indeed, save money, but it would have to be properly monitored, and again, it would tend to benefit most the people who can already afford health care.

Similarly, the medical savings account is the equivalent of privatization of Social Security. The idea is to expand our current system of putting tax-deferred income into a designated medical account. These accounts have the potential to provide an interesting and attractive long term financial planning device, but again, they do not solve the problem of funding health care for older adults who are not able to save.

In terms of Long Term Care, the picture is even more bleak (Slide 24). Suggested ways of providing funds for long-term care include expanding Medicare and Medicaid to cover more chronic care. The appealing nature of this suggestion is that the infrastructure is already there, so implementation would be relatively simple. However, to do this would require an enormous increase in taxes and user premiums, something that is unlikely to happen in the current climate in the US. Another suggestion would be to subsidize "uncompensated" or "donated" care through tax credits. For example, if a working woman had to cut back her hours, or quit her job altogether to care for a frail older relative, the federal government would allow a certain credit on her income taxes, similar to those currently in use for child care. While tax credits are politically easier to swallow than actual payment of benefits, the fact remains that revenues to the federal government would decrease, thus making this option

somewhat unlikely to happen.
Finally, one proposal to fund long-term care is to stimulate the growth of the long-term care insurance industry, presumably also through tax incentives. Long-term care insurance is a decidedly growing field, having started badly in the 1980s and early 1990s. In the beginning, companies were plagued by an inability to adequately price their policies, and older adults were plagued by high costs and exclusions contained in fine print in their policies. In the 1990s, however, the US government began to require that policies be written that were easier to understand, and the industry found better ways to price their policies. For older adults, however, the age at which they buy these policies is critical - as with all insurance policies, the closer you are to needing them, the more they cost.

Real Solutions

Most demographers and economists agree that most if not all of our problems with funding our social welfare programs would be minimized, if not corrected altogether, if the economy were to continue to grow, certainly as it has in the past 10 to 15 years. In the absence of guarantees, however, there are concrete things that Americans can do (Table 3).
First, the government must find creative ways to encourage private and public savings. Some methods are already being undertaken - the balancing of the federal budget was an obvious first step; however, the retirement of the national debt is another issue entirely and needs to be addressed. Second, the government needs to make a concerted effort to educate the American public on our social welfare programs. The Social Security Administration and the Health Care Financing Administration have long known that, even among citizens who receive Social Security and Medicare, these two major programs are not well understood. If we are to remain committed to these programs in the long run, we must be sure that the American people understand who pays for what types of benefits, and what they would have to pay out of their own pockets, if those programs were not in place. Third, the single most important way to guarantee a growing economy is to have a well-educated and productive workforce. In my view, it is not acceptable that we should have to import workers for the high-technology industry due a shortage of properly trained workers in our own workforce. The U.S. needs to put more of its money where its mouth is, in funding public education in particular.

What the US and Japan can learn from one another

At the risk of significant oversimplification, Japan has two characteristics that I think could benefit the US, should we ever choose to adopt them (Table 4). First, the US is consumed by short term thinking; we are famous for postponing action on our problems until they are actually staring us in the face; at the same time, our economic system is built on a system of short term financial gains - indeed, short term used to mean quarterly profits in our country; now, short term means the stock price each day. Japan has traditionally been much better at evaluating their society with the long term in mind allowing, in my view, a more balanced way to examine the true costs and benefits of social programs.
Second, compared to the US, Japan does a much better job of making it not only possible, but desirable, for older workers to continue working, both approaching and after the traditional retirement age of 60. In the US, we have only just eliminated the tax penalty for citizens on Social Security to keep working; at the same time, our industries are

rather backward, in terms of developing phased retirement programs, partly due to the different way that our large industries are organized compared to Japan's. In order for the US to adopt some of these policies, laws regarding age discrimination in employment would have to be changed and, quite frankly, I do not see our unions (and other vested interests) allowing that to happen.

From the US, however, I believe Japan could learn a lot in terms of ways to provide chronic, or long term, care. The rapid increase of the elderly population in Japan, combined with the declining fertility rate, has resulted in increasing demand for long term care services. This demand is exacerbated by significant declines in multi-generational households, increasing female labor force participation, and something of a cultural revolution in which Japanese women are beginning to resist the traditional role of caring for their husband's mothers.

While our long term care policies are somewhat disjointed, we do have a relatively healthy network of institutional and home- and community-based systems of long term care delivery, as well as considerable experience in trying alternative means of funding such care. I know that, as we speak, Japanese social and policy researchers are consulting with their American counterparts in order to gain knowledge from the American experience with long term care - not simply what works well, but also lessons we have learned about what does not work well. In the meantime, of course, the Japanese government has taken a number of steps, of which I am sure you are all familiar, to address these concerns, including the implementation of the Gold Plan, as well as the 1997 Long Term Care Insurance Act, which I believe was due to be fully implemented this past April.

In short, we are all in this together - we are all facing the increasing challenges of supporting our growing elderly populations - and I believe that we can learn much from one another, if we will only allow ourselves to do so. Unfortunately, I think that the willingness tends to be there in the academic and business communities - the general public tends to lag behind, and we all need to do a better job in educating our people on these important issues, different options, and the relevant costs and benefits of each.

Fig.1

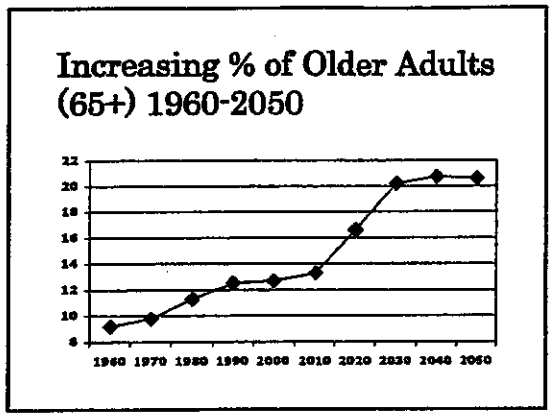


Fig.2

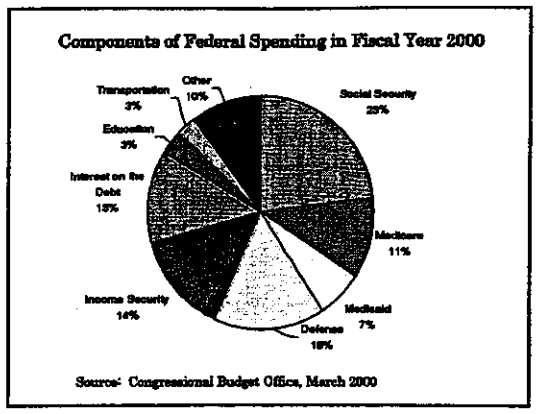


Fig.3

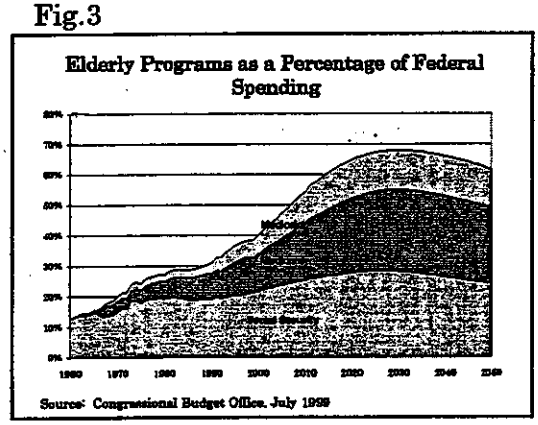


Fig.4

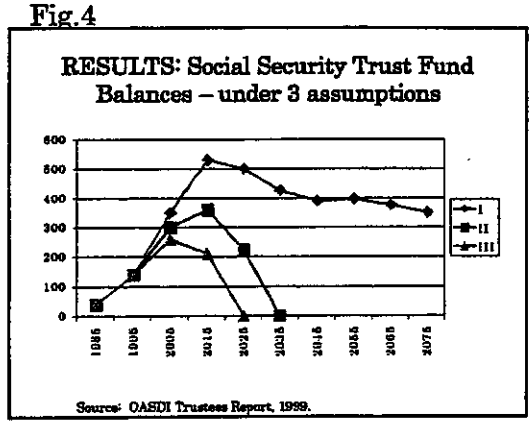


Fig.5

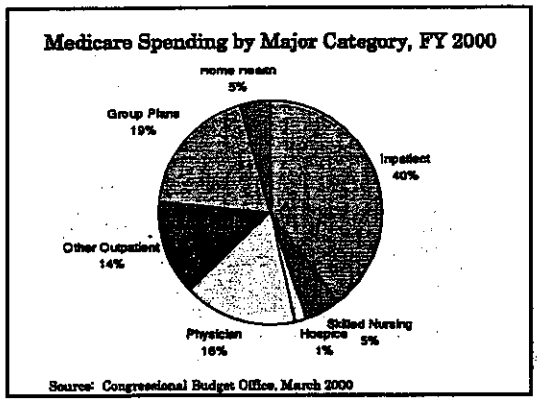


Fig.6

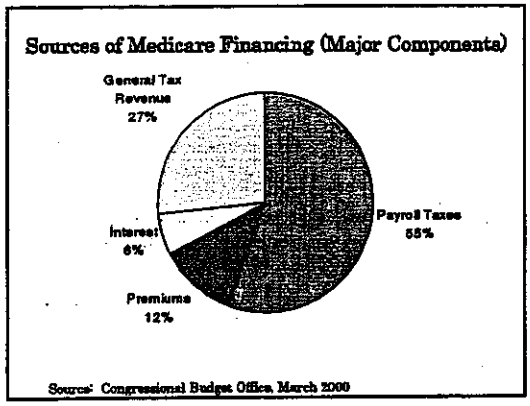


Fig.7

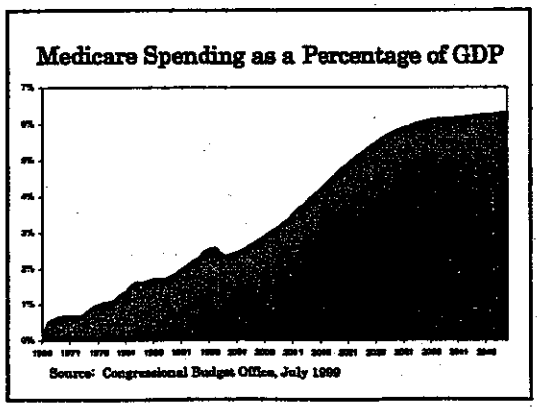


Fig.8

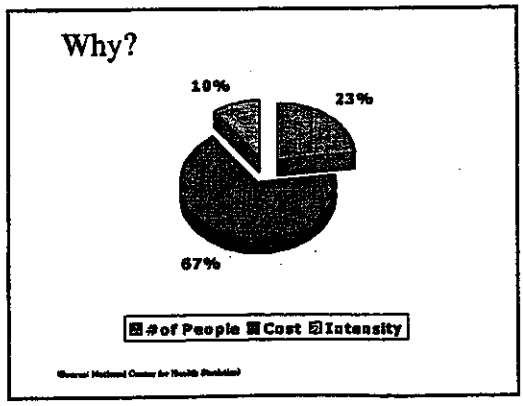


Fig.9

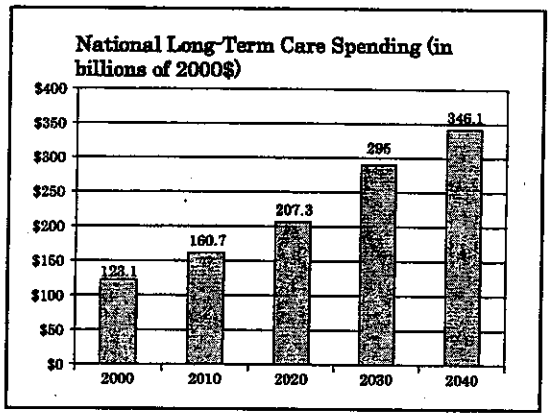


Fig.10

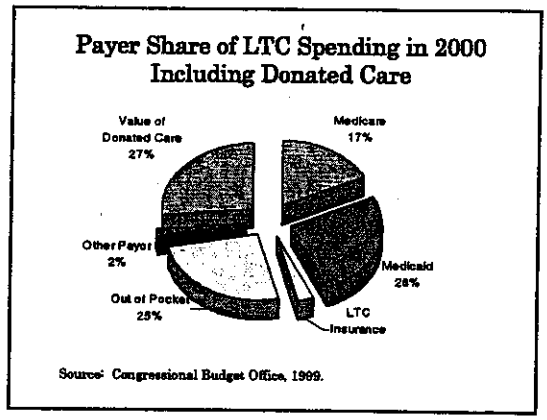


Fig.11

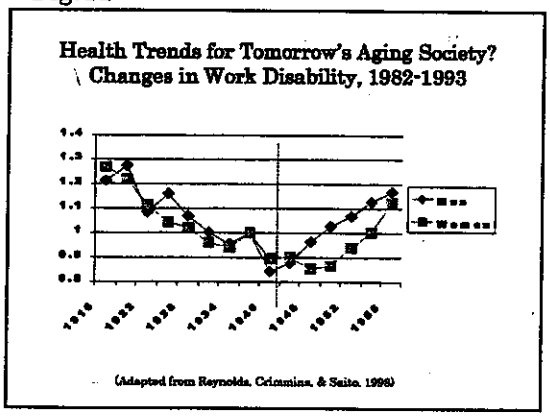
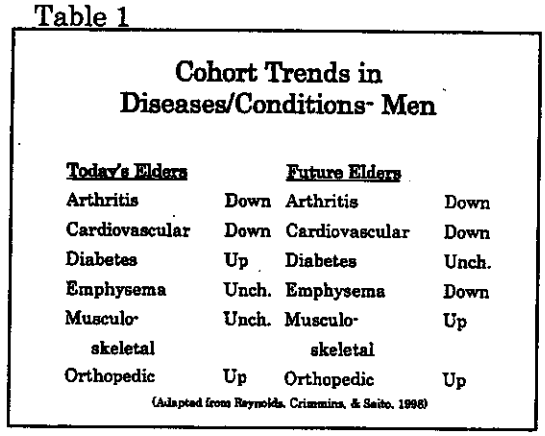


Table 1

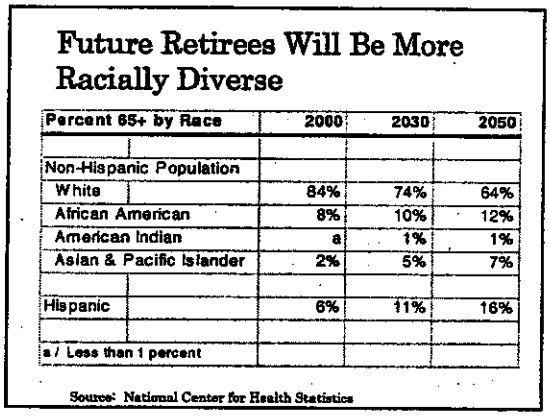


Cohort Trends in Diseases/Conditions- Men

Today's Elders		Future Elders	
Arthritis	Down	Arthritis	Down
Cardiovascular	Down	Cardiovascular	Down
Diabetes	Up	Diabetes	Unch.
Emphysema	Unch.	Emphysema	Down
Musculo-skeletal	Unch.	Musculo-skeletal	Up
Orthopedic	Up	Orthopedic	Up

(Adapted from Reynolds, Crimmins, & Saito, 1998)

Table 2



Future Retirees Will Be More Racially Diverse

Percent 65+ by Race	2000	2030	2050
Non-Hispanic Population			
White	84%	74%	64%
African American	8%	10%	12%
American Indian	a	1%	1%
Asian & Pacific Islander	2%	5%	7%
Hispanic	6%	11%	16%
a / Less than 1 percent			

Source: National Center for Health Statistics

Fig.12

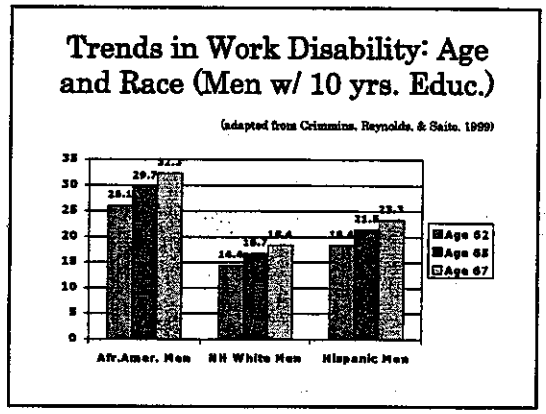


Fig.13

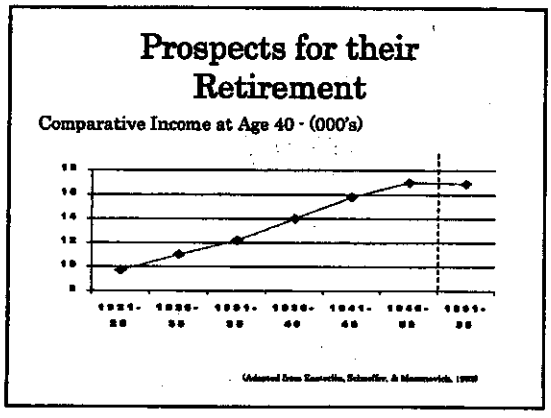


Fig.14

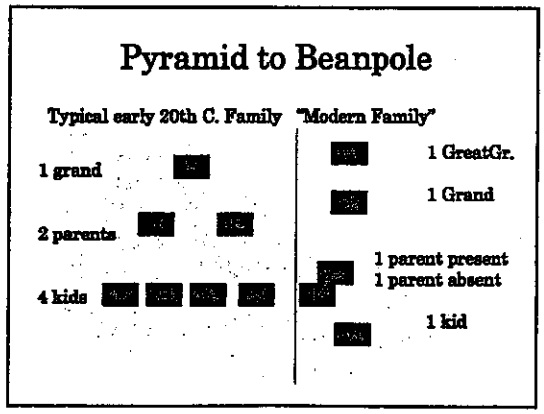


Table 3

Economy of U.S.

- Find ways to encourage private and public savings
- Continually educate American public on public programs
  - Who pays for what
  - Who would pay in their absence
- Encourage growth -- EDUCATION

Table 4

What U.S. and Japan can learn from one another

- Japan looks much more to the future; US is focused on the short term.
- Japan has much more flexible system in which older workers can continue to be productive.
- US has greater experience and infrastructure for formal long term care—both positives and negatives

Future Perspective: Strategies for Management of Life style related Diseases, Diabetes in Japan

Shigeaki Baba, Toshiro Katayama, Seiki Nambu and Yasuro Kameno
International Institute for Diabetes Education and Study

In Japan, recent affluent society underwent the structural change along with changes of our modern life style and advancement of new technologies. As shown in Fig.1, newly emerged concept, human inventory is now introduced to various activities, individualism is further emphasized and diverse choices are given to our daily lives, which lead the society to respect human aspects and healthiness of its citizen.
As the result of it, we started to recognize the change of value which motivates us to put people or humanity as the core concept in urban planning. We can say that especially in the field of medical treatment, the basic principle has been shifted to human health and science.

Japan required to come up with countermeasures for many issues such as westernized dietary life style, environmental pollution and the huge difference and gap in the sense of values between the generations.

Therefore, the Japanese Ministry of Health and Welfare issues a new policy, "Healthy Japan 21" in April 2000 (Fig.2).
This policy is designed based on the progression of the aging society with less children, the increase of the elderly who needs special care, the increase of life-style related diseases, and the increase in medical cost. The basic idea of this policy is to extend the span of healthy life as well as to improve the Quality of Life
The modern medical treatment is centered to the patients and it requires optimal care to improve the Quality of Life.

Following is my medical philosophy in setting diabetes strategy, responding to these newly emerged challenges.

1. Future direction of diabetes strategy and EBM

Evidence-based Medicine, EBM, is reasonable medical care which is well supported by the scientific evidence and acceptable to patients. As in Fig.2, it is designed to achieve the fairness and holism in providing medical care and to establish medical economics. In order to implement EBM, each specific care and its way of provision has to be evaluated based upon cohort studies.
Further, patient's compliance is regarded as one of the key factors for the successful medical care. Recently, it is said that how to obtain an adherence of the patients is another key factor.
This will encourage patients for their willingness and ability to change behavior, so that they can psychologically adjust to diabetes. Once you establish adherence of the patient, it will lead the patient for his/her self-management with confidence.
The next concept is informed consent at medical care aimed the improvement of QOL. Now the time has passed to change from informed consent to informed choice. Self-realization calls for individual recognition and optimal medical care. It also

requires to adjust the environment which enables such medical care is fully implemented. QOL was the indicator of medical ethics in 20th century. In this new century, QOC, quality of community has to be also emphasized, which implied the 21st century type medicine, namely the third new medicine. (Fig.3)

It is essential for us who are health/medical professionals to recognize that human ethics is reflected into the community planning. Accordingly, with the emphasis on the prevention of diabetes, and having the objective of improving the Quality of Life of people with diabetes, the International Institute for Diabetes Education and Study (IIDES) was established on the basis of worldwide cooperation, 1998 in Kobe. The merit of this institute lies in its accumulation of modern medical research information, and in its role as a place of education and learning for health professionals, thus it contributes to both a healthy society and the creation of a comfortable community life.

2. Future direction of diabetes prevention project

Chronic non-communicable diseases, i.e. diabetes, cancer, cardio-vascular diseases, have common risk factors. These diseases can be controled or prevented by intervention as the Interhealth Project (WHO).
Nowadays diabetes prevention project can be summarized into several topics as it is shown in this slide (table 2).

Namely, it is 1) genome study,
2) molecular-gene epidemiology,
3) intervention trial for high-risk people,
4) population-based intervention, 5) Teaching and learning strategies for diabetes lifestyle and self-care, 6) interactive computer communication system for diabetes prevention and care.

In this prevention projects, I'd like to focus on systematic medical care based on information technology (IT) revolution and multidisciplinary team care, because in the recent advancement these modern systems are very important and indispensable issues.

1) Changes of clinical practice of diabetes caused by IT

Due to the advancement of information technology, so called IT revolution, new clinical practice is to be developed. It is important to consider how to use IT and identify what kind of society that we wish to create. We have to utilize information. Once information is utilized, it creates value. Furthermore computer technology enables us unrestricted communication overcoming the geographical limitation, e.g. online distance education and/or clinical treatment in medical collaboration.

Table 3 describes the specific strategies to promote computer literacy which will give a great impact on medical care, health and welfare. For instance, in developing a patient support system, IT is indispensable for networking, especially for 2-way communication, i.e. interactive computer communication system. This is a diagram of the network which support patient care and patient referral (Fig.4).

Additionally patient database and electronic patient chart will be easily implemented.

IT can easily show a digital figure such as three-dimensional trend graph, blood glucose trend, DVD based figure and reports on an electronic patient chart. Namely, these will contribute to efficiency of clinical care, timely response and appropriate treatment

evaluation. Furthermore, IT will support us for the follow-up of diabetic care and allow us not only to analyze data for evaluation but revise the method of evaluation. Furthermore, better visualization of analysis or new way of expression of analysis at clinical practice can be done by IT.

One of the examples is shown here. (Fig.5) First step of diabetic care is the guidance to correct a patient's lifestyle. This slide depicts how evaluation changes as a result of correction of his/her life-style. Then, in order to identify the comprehensive treatment efficacy, analysis is done as shown in Fig.6. When mental pressure such as stress is reduced, treatment evaluation gets high, which indicates that the patient condition improves. As it is clear in this example, utilization of IT makes treatment evaluation easier. Therefore it will be a powerful support for the holistic medical care. At the same time, it will be a great support to patients for their better understanding, which will promote their independence and satisfaction for them.

2) Importance of team medical care and network

Technology advances in immeasurable speed and so does its application. These technologies should be properly adopted and turned into a valuable method for patient care. This can be realized only by multidisciplinary team medical care.

Medical team is an advisor to the diabetic patients and at the same time it is important to be a good partner for them.

For that purpose, teaching and learning is indispensable. But what is more important is humanity. Humanism is the very basic principle for all the activities in medicine. We should not forget that we, not only medical professionals but also those who are supporting these professionals and in some cases family members and friends have to work as a team in facing with problems of patients. When we do so, we can create a strong impact in our care.

I would like to talk about the national diabetes strategies in Japan.
Table 4 shows the prevalence of diabetes in Japan, in 1998. Among 124.7 million Japanese population, strongly suspected DM is 6.9 million (5.5%), undeniable possibility of DM is 13.0 million (10.4%), and DM under treatment is only 2.18 million (1.74%). Regarding this situation of diabetes in Japan, the national diabetes strategies are indicated as follows:

1. Establish a regional network, i.e. multidisciplinary teamwork.
2. Train educators, i.e. educators education for all health-care professionals
3. Educational method, tools and guideline for diabetic patients, family, health sector, government and community as well as health-medical staffs
4. Administrative policies
5. Approach to medical economics

Therefore multidisciplinary team approach is very important for diabetes care, and this is also true to other non-communicable diseases care.

Conclusion

I reviewed one aspect of recent advancement in relation with diabetes strategy. We will pursue health care, prevention and medical treatment through establishing medical care strategy based on evidence based medicine. It can be said what we are trying to do is the

multidisciplinary team care, we are trying to achieve comprehensive care. Human total care should hold up its philosophy of love. (Fig.7)

New concept of health is a door to develop health environment and health-culture. What we are expected to do is to reflect local trait such as tradition, culture, custom, ethnic and historys into such a new concept.

I firmly believe that diabetes and non-communicable diseases strategies, philosophy and scientific progress will create 21st century medicine.

Fig.1

Structural Change in Industrial Society

Industrialized society

⇩

Change from quantity to quality

⇩

Human inventory

⇩

Human ecology and city development

- human biology
- health promotion for comprehensive community with nature, culture and science

Table 1

EVIDENCE-BASED MEDICINE (EBM)

- Evaluation of medical treatment (cohort study)
- Compliance and adherence
- Equity in medical practice
- Comprehensive medicine
- Quality and efficiency
- Economics

Fig.2

HEALTHY JAPAN 21

Japan Ministry of Health and Welfare, 2000

Background

Progression of aging society with less children
Increase of the elderly who needs care
Increase of life-style related diseases
Increase in medical cost

⇩

Aims

Extension of health life-span
Improvement of QOL

⇩

A new health policy

Health promotion
Prevention and optimal care
Health & Welfare community
Citizen's participation

Fig.3

Evidence Based Medicine

⇩

Informed Consent
approach to QOL

⇩

Informed Choice
individuality, decision making, appropriate treatment

+

Quality of Community
improved environment for health, QOC

Table 2

Diabetes Prevention Projects

1. Genome Study
2. Molecular-Gene Epidemiology
3. Intervention Trial for High-risk persons
4. Population-based Intervention
5. Teaching and Learning Strategies for Diabetes Lifestyle and Self-care
6. Interactive Computer Communication System for Diabetes Prevention and Care

Table 3

Computer Literacy on Medicine, Health Welfare

- Network literacy
- Interactive communication system
- Database and electronic patient chart
- Virtual reality technology
- Nano-technology

Fig.4

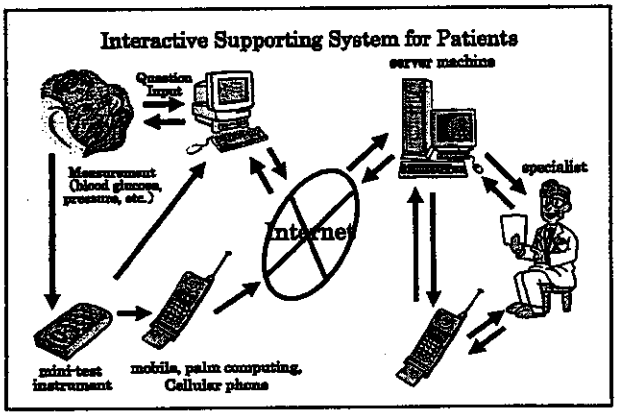


Fig.5

Evaluation of Life-style

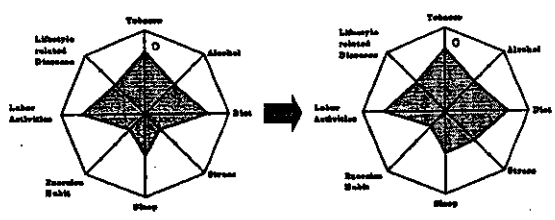


Fig.6

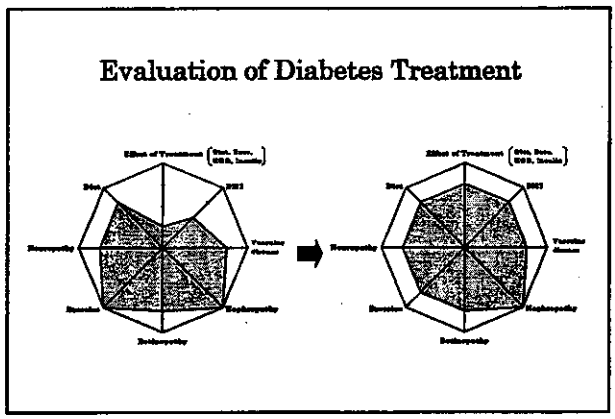


Table 4

Diabetes in Japan, 1998		
Population	124.7 million	
Strongly suspected DM	6.9 million	(5.5%)
Undeniable possibility of DM	13.0 million	(10.4%)
DM under treatment	2.18 million	(1.74%)

Fig.7

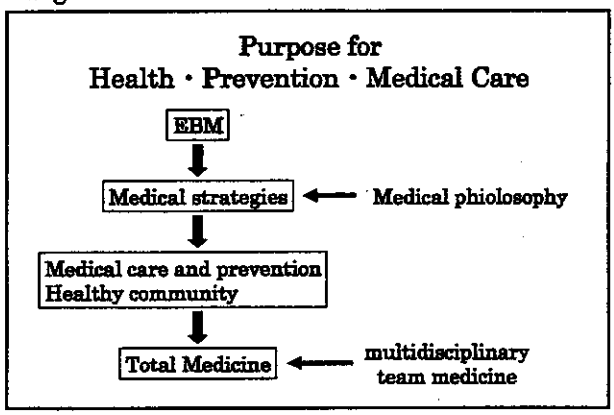
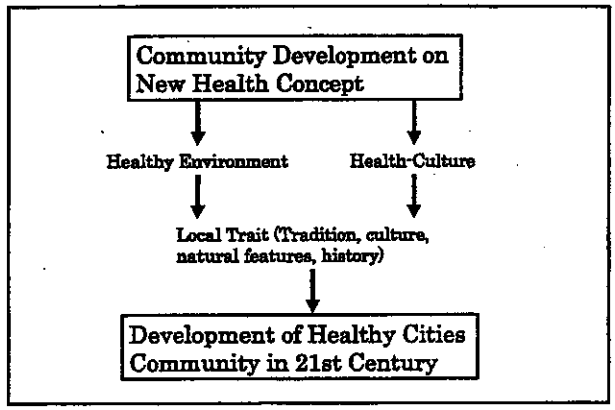


Fig.8



大都市災害に伴う社会構造の変化と復興推移の考察
特に人口動態にみる推計学的考察

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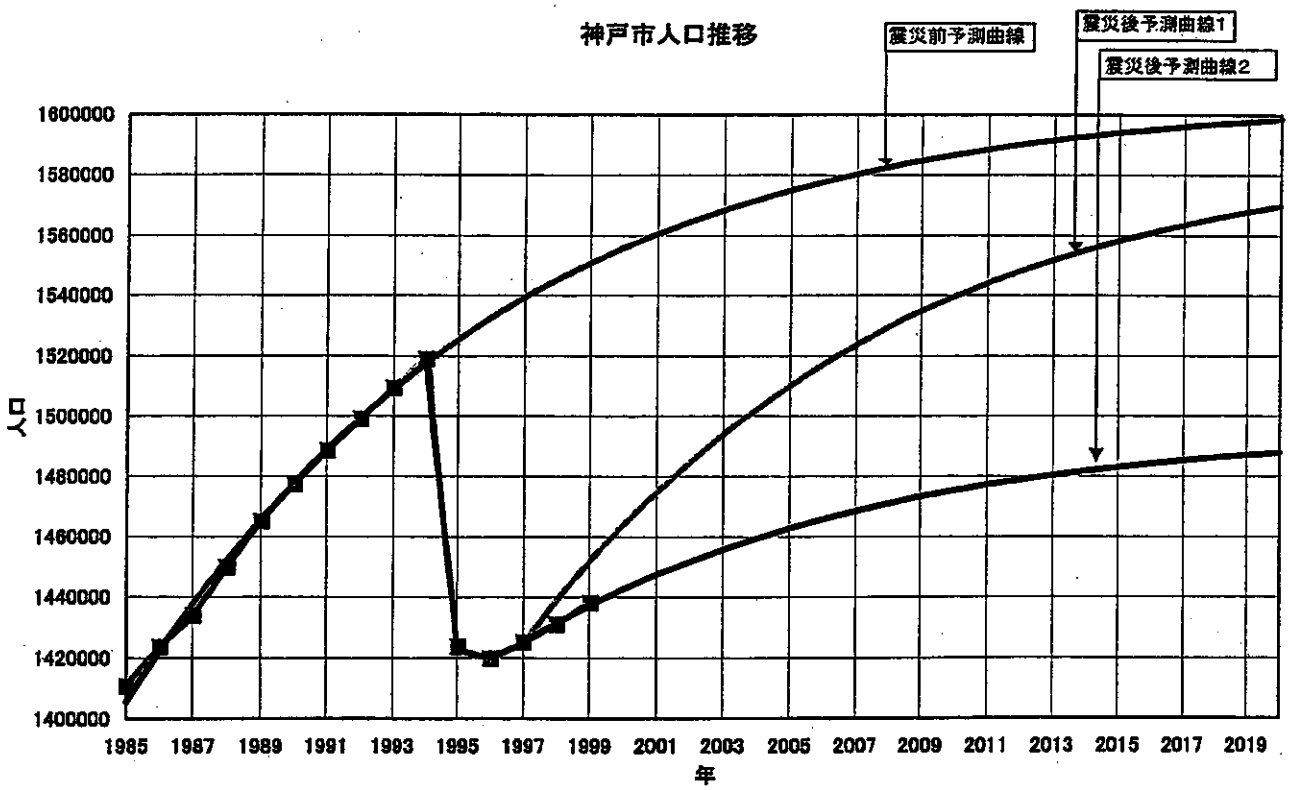
1．神戸市の人口推移による復興の動向



神戸市の震災後の人口推移

平成 11 年度の研究は、1996～1998 年：開発途上国における都市化と健康問題に関する研究として発表したのが、上図に示した曲線であった。この図にみるごとく、阪神淡路大震災により、人的被害とともに自然及び社会的人口増減要因で、神戸市の人口は急速に減少し、公共事業を中心とした復興事業の進展により、1997 年に若干の増加の兆しが現れた。この人口推移予測後の 2 年間（1998 年・1999 年）の神戸市の人口は、公共事業を優先した復興事業や市民の努力による人口推移予測曲線 2 に平均誤差 0.042%で一致していた。

○　震災後の人口推移予測曲線２

1996～97 年の公共施設を中心とした社会・生産基盤の復旧対策の進展に伴う人口推移の予測

人口変化率　：

$$\frac{dX_i}{dt} = \gamma X_i\left(1 - \frac{X_i}{K}\right)$$

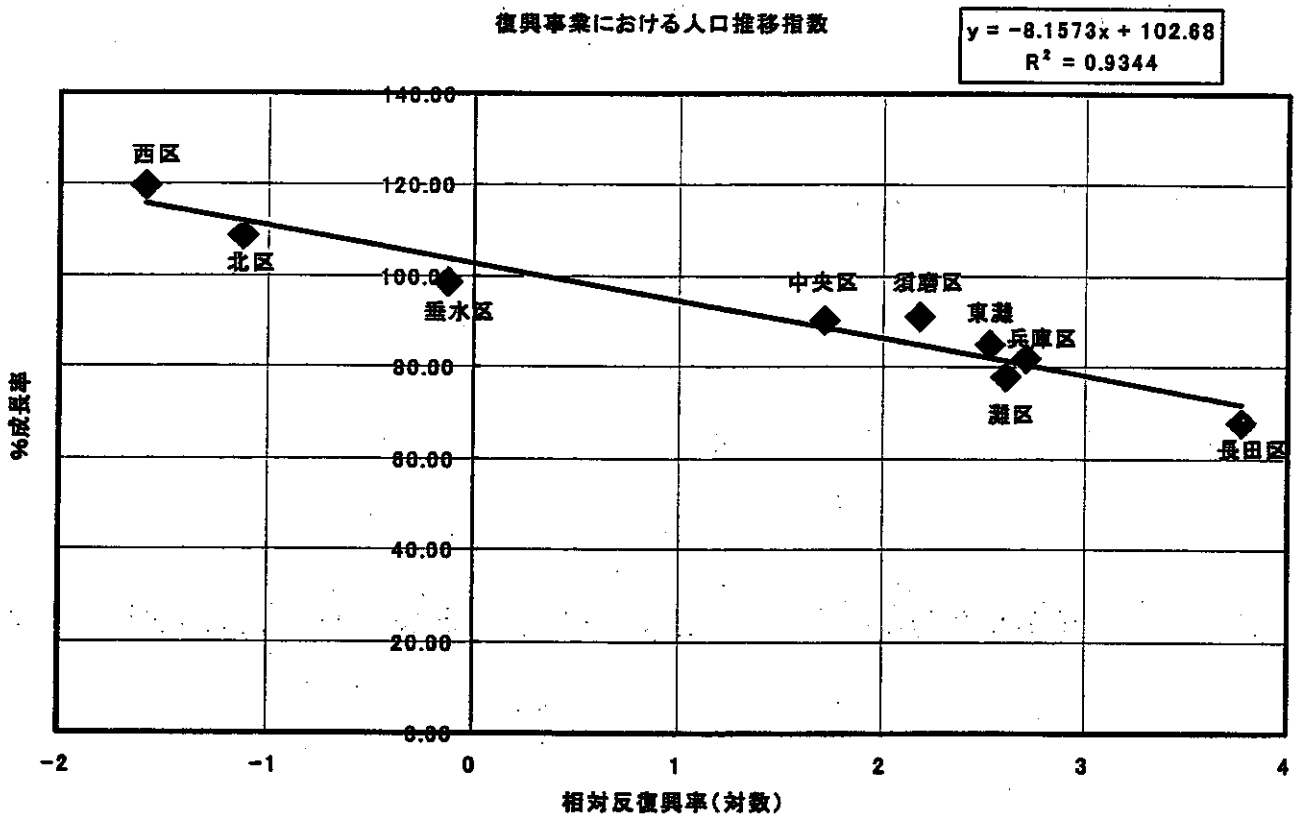
人口増加率　：　$\gamma = (\alpha - \beta) + (\theta - \lambda)$

α：出生率、β：死亡率、θ：神戸市への転入率、λ：神戸市からの転出率

神戸市の人口収容力：　$K = X_{I-1}\exp(\kappa t)$

κ：収容率＝建築着工率及び事業所の変動率

神戸市の各区における人口推移



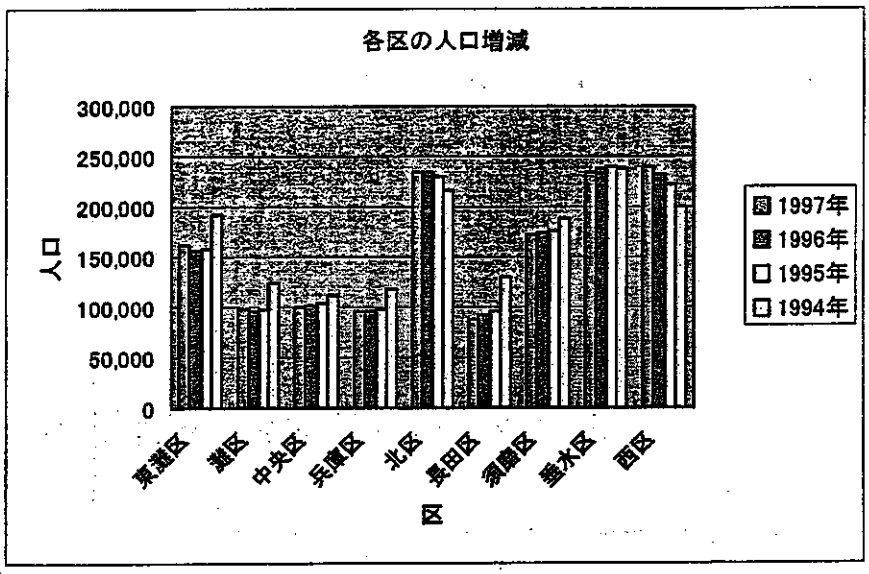
神戸市全域において、復興事業の最大の目的は現状復帰であり、現状復帰を基本とした人口推移は予測において前述のグラフの予測曲線２であり、1998 年・1999 年の人口増加はこの曲線に一致している。

ここで、神戸市各区（東灘区、灘区、中央区、兵庫区、北区、長田区、須磨区、垂水区、西区）の震災後の人口増減を、震災被害と公共事業の状況の相対値で検討を加えた。ここで、震災被害は区域面積当りの家屋の倒壊数と火災被害による焼損述床面積により求め、公共事業の状況は区域面積当りの新設着工住宅数により求めた。また、震災被害と公共事業の状況の比を相対反復興率とした。

[結果]

相対反復興率と人口増減率は指数関数的減少関係が有り、震災被害が小さく人口収容力の大きな区ほど震災前に比べ人口が増加し、震災被害が大きく人口収容力の小さい区ほど震災前の人口への復帰が困難となっている。さらに、各区の震災被害が新設着工住宅により補われたとすると、人口は 2.65%の増加を示している。

	差	%	1997 年	1994 年
東灘区	-28708	85.01	162832	191540
灘区	-27328	78.12	97563	124891
中央区	-10670	90.43	100866	111536
兵庫区	-21496	81.77	96422	117918
北区	18541	108.58	234577	216036
長田区	-42204	67.65	88262	130466
須磨区	-16617	91.20	172246	188863
垂水区	-3257	98.63	234524	237781
西区	39090	119.55	239041	199951



○ 平成 13 年度研究方針

人口推移を自然増減と社会増減及び人口の収容力を指標として、全固体数のみに着目し、その数の変動を調べてきたが、大都市マイノリティとしての社会的弱者である高齢者等を考慮した場合には、人口を構成する年齢層を考慮し、齢層による震災後の生活状況の変化を考慮した時間的・空間的変動を調べる必要がある。

(1) 各年齢層における自然増減率と社会増減率の違いによる人口動態

(2) 各年齢層による生活環境の変化

(3) 各年齢層による罹患状況

書籍

著者氏名	論文タイトル名	書籍全体の編集者名	書籍名	出版社名	出版地	出版年	ページ
馬場 茂明	開発途上国における都市化と健康問題に関する研究（1996～1998）	馬場 茂明	厚生省国際医療協力委託研究最終報告書			1999	

雑誌

発表者氏名	論文タイトル名	発表誌名	巻号	ページ	出版年
馬場 茂明	New vision in prevention and control of diabetes	Diabetes	1994	P.3-11	1995

(分担) 研究報告書

平成12年度厚生科学研究費補助金（健康科学総合研究事業）

大阪都市圏におけるマイノリティの保健医療サービスの利用状況

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研究要旨

大阪都市圏における保健所の中から地域特性を考慮して14保健所を抽出し、平成11年の新登録結核患者を対象に調査を行った。分析対象の新登録患者は2,375人であった。これらの者について、医療保険区分、職業区分、住居区分別に患者を分析し、保健・医療サービスの利用状況について検討を行った。都市の中には組織化されていない、不安定生活者、不安定雇用者が多くいると推測される。結核を発症した者から分析すると、これらの者においては、発症前の検診の受診率が低く、発病時の医療サービスも国公立病院よりも民間病院および特定機関に依存している者の割合が高かった。生活基盤が脆弱なことから通院治療の形態の者の割合は低く、入院で治療を受けている者の割合が高い状況にあった。つまり、届け出制の疾患であり結核患者を下にマイノリティーの問題の検討を行ったところ昨年度の分析結果で示された地域的にインナーシティー問題として局在している傾向にあるとともに、社会経済的な階層別に偏在化傾向にあることが明らかとなった。わが国の今日の社会状況は、高齢社会の到来し、医療保障制度の安定が大きな課題となっている、その反面、国民の生活水準の向上し、安定生活者がマジョリティとなっている。しかし、日雇い労働者、自営業、零細事業所の勤務者等の不安定労働者・雇用者は近年は人数の上では多くはなくなった。これらの者に対する保健医療サービスについてはかってはこのような不安定雇用者がマジョリティーであったものが、今日の安定社会においてはマイノリティーとなっている。事業主・雇用主、市町村長に依拠する保健医療サービスの体系に当てはまらないマイノリティーに対する保健医療サービスの充実には社会的な新たな対策が必要であると考えられた。今回、研究の対象として調査を行った結核患者は、個人の健康の観点と同時に社会的影響を有する疾患である。その克服には、保健所制度の強化とともに、社会の中のマイノリティーの人々に対する保健医療サービスの充実を必要と考えられる。次年度は、このマイノリティーの人々の保健医療サービスを充実させていく方向性を明らかにし、研究を総括する予定としている。

A．研究の目的

都市には、地域（住民）にも、職域（事業所）にも組織化されていない者が多く存在している。これらの自治体からも、職域からも、組織的、安定的な健康管理を行うことが困難な者を、本研究における都市のマイノリティとした。「都市のマイノリティ」は、住民登録を必ずしもしていることはないことから通常の自治体による保健サービスの対象者からもはずれていることが多いと考えられる。また、不安定雇用者であるために職域からの保健サービスの対象者としてカバーされていることもない状況にある。

したがって、これらの者を対象とした保健医療サービスの利用状況に関する調査研究は通常は困難である。そこで、医師による届出が義務づけられている疾患については、その発症者について、マイノリティーの者も含めてその全体が把握できる状況にある。特に、わが国では、結核を発症した場合は保健所に、一定期間登録し、患者管理する制度が定着している。

B．研究方法

調査対象者は平成11年1月1日から12月31日までの初感染登録患者を除く、新登録患者とした。調査は調査票を用いて、平成11年12月～平成12年1月末（年末登録患者の点検の時期にあわせる）にあわせて実施した。