

図4 リスク別リスク保有者人数のプログラム前後の比較

### 3. 身体測定値のプログラム前後の比較

#### 1) 体重・腹囲の増減率による人数の比較

プログラム前後の比較で、体重・腹囲の増減率を検討した。それぞれ、2%増減、5%増減に区切り、集計した。プログラム介入後に2%以上体重が減少した人は、38人中21人の55.3%で、腹囲が2%以上減少した人は、38人中27人の71%であった。

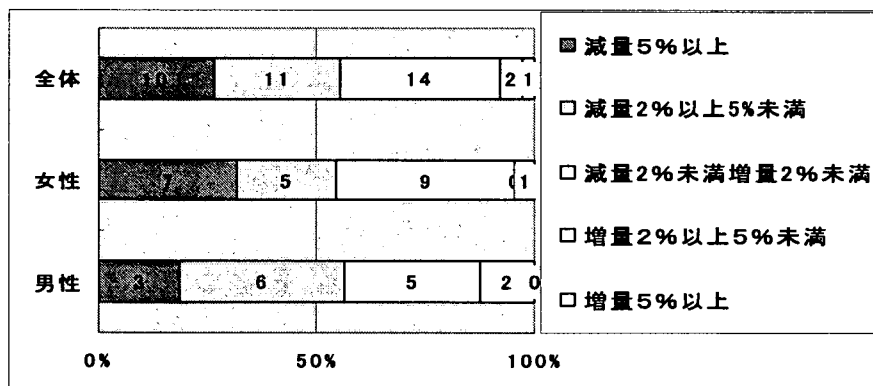


図 プログラム前後の体重の増減率による人数

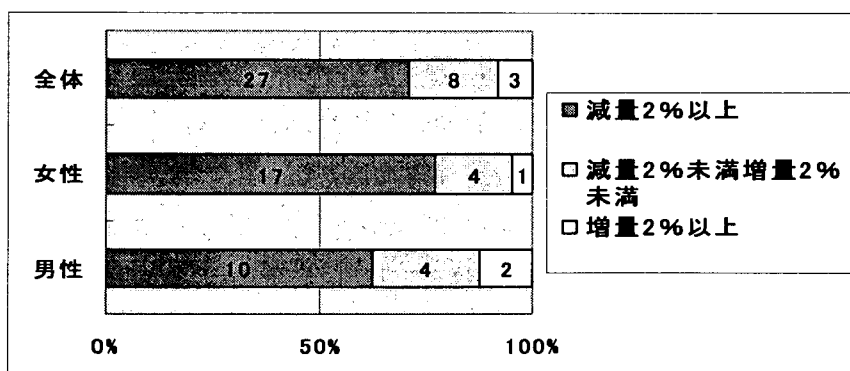


図 プログラム前後の腹囲の増減率による人数

#### 4. プログラム前後の生活習慣

生活習慣においては、食習慣および運動習慣について、その改善度により比較した。改善度は、メール、手紙などのコミュニケーション内容および生活習慣質問表の回答を参考に、初回より明らかに改善が見られるものを改善群、少しは改善が見られた対象者を軽度改善群、ほとんど生活習慣の改善が見られなかった対象者を不変群と判定した。

##### 1) 食生活習慣評価

食生活習慣については、対象者の食事記録、コミュニケーション内容、指導に対する反応などを総合的に判断した。初回から食習慣がほとんど変わらなかったのは1名のみで、他は支援内容に答える形で日常の食生活の改善が見られた。食生活習慣の集計は、食事記録を最後まで提出した29名を分析対象者とした。

表6 食生活習慣改善度評価

	人数	改善群	軽度改善群	不変群
男性	11	9	2	0
女性	18	12	5	1
全体	29	21	7	1

##### 2) 運動習慣評価

運動生活習慣においては、日々の実行記録、コミュニケーション内容、指導に対する反応および1日平均歩数の増減などから総合的に判断した。初回から運動習慣がほとんど変わらなかったのは1名のみで、他は支援内容に答える形、あるいは1日平均の歩数が1万歩に近づいたなど、日常の運動習慣の改善が見られた。

表7 運動習慣改善度評価

	人数	改善群	軽度改善群	不変群
男性	16	10	5	1
女性	22	16	6	0
全体	38	26	11	1

##### 3) 生活習慣改善度と体重・腹囲増減率

生活習慣改善度と体重・腹囲の増減率を比較した。

食生活習慣の改善群・軽度改善群・不変群における体重および腹囲の増減率を比較した(表8、9)。体重は改善群の52.4%が、腹囲は71.4%が、初回に比較して2%以上の減少が見られた。

表8 食生活習慣と体重増減率

		食生活習慣評価					
		改善群		軽度改善群		不変群	
		人数	%	人数	%	人数	%
体重増減率	減少率2%以上	11	52.4%	4	57.1%	1	100.0%
	増減率2%未満	8	38.1%	3	42.9%	0	0.0%
	増加率2%以上	2	9.5%	0	0.0%	0	0.0%
合計		21	100%	7	100%	1	100%

表9 食生活習慣と腹囲増減率

		食生活習慣評価					
		改善群		軽度改善群		不変群	
		人数	%	人数	%	人数	%
腹囲増減率	減少率2%以上	15	71.4%	4	57.1%	1	100.0%
	増減率2%未満	4	19.0%	3	42.9%	0	0.0%
	増加率2%以上	2	9.5%	0	0.0%	0	0.0%
合計		21	100%	7	100%	1	100%

運動習慣の改善群・軽度改善群・不変群における体重および腹囲の増減率においては、表10、11に示すように、体重は改善群の53.8%が、腹囲は69.2%が初回に比較して2%以上の減少が見られた。運動習慣が改善されたものの体重・腹囲が2%以上増加した3名のうち2名は男性で、BMIが20.9、18.7と標準体重以下であった。また、腹囲が82.5cm、79cmで、もともとメタボリックシンドロームではなく他のリスクがあったために本プログラムに参加していた。残りの女性1名は当初BMI30.7、腹囲101cmで、高度肥満。運動の記録はないが、歩数が1万歩に達したために運動習慣を相対的に改善されたと評価した。しかし、食事記録の提出が中途からないことから、食生活のコントロールはあまりできなかったために体重・腹囲の増加となったのではないかと推察する。

表10 運動習慣と体重増減率

		運動習慣評価					
		改善群		軽度改善群		不変群	
		人数	%	人数	%	人数	%
体重増減率	減少率2%以上	14	53.8%	6	54.5%	0	0.0%
	増減率2%未満	9	34.6%	5	45.5%	1	100.0%
	増加率2%以上	3	11.5%	0	0.0%	0	0.0%
計		26	100%	11	100%	1	100%

表11 運動習慣と腹囲増減率

		運動習慣評価					
		改善群		軽度改善群		不変群	
		人数	%	人数	%	人数	%
腹囲増減率	減少率2%以上	18	69.2%	9	81.8%	0	0.0%
	増減率2%未満	5	19.2%	2	18.2%	1	100.0%
	増加率2%以上	3	11.5%	0	0.0%	0	0.0%
計		26	100%	11	100%	1	100%

## 5. 成功事例の紹介

今回の保健指導対象者の中から、生活習慣がプログラム終了時に明らかに改善され、検査データの上でも改善が見られた2事例を紹介する。

<事例1> 男性、50代、身長170cm、体重60kg、腹囲80cm

### 1) 生活習慣改善への取り組み

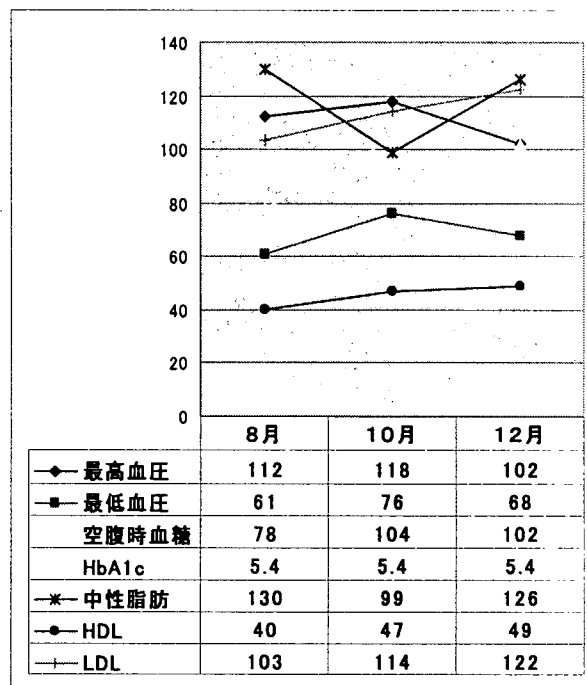
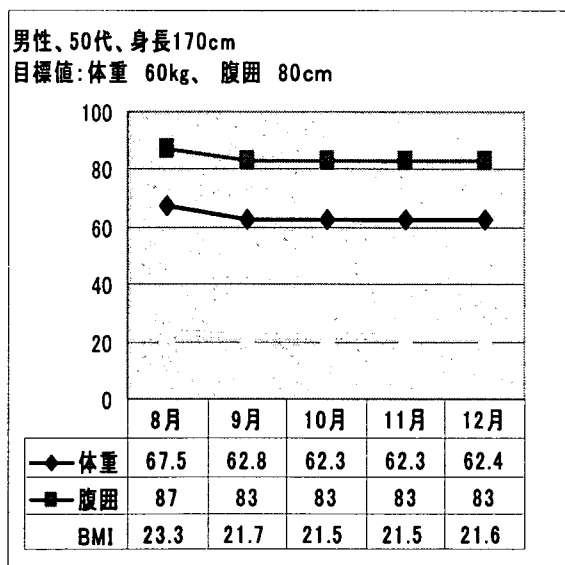
#### <食習慣>

- ・ 魚中心で野菜も意識して摂取するようになった
- ・ 初回と比べると食品数が増えた
- ・ 水溶性ビタミンが増え、炭水化物が減った
- ・ 夕食の割合はまだ多いが、ビールはカロリーオフのものにした

#### <運動習慣>

- ・ 歩数は平均して1日1万歩の習慣がついた

### 2) 身体測定値、検査データの変化



<事例2> 女性、50代、身長155cm、体重59kg、腹囲86cm

1) 生活習慣改善への取り組み

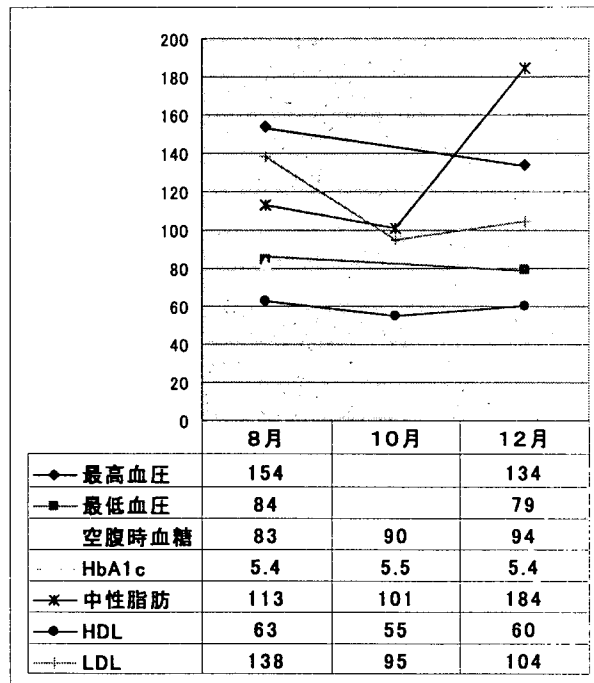
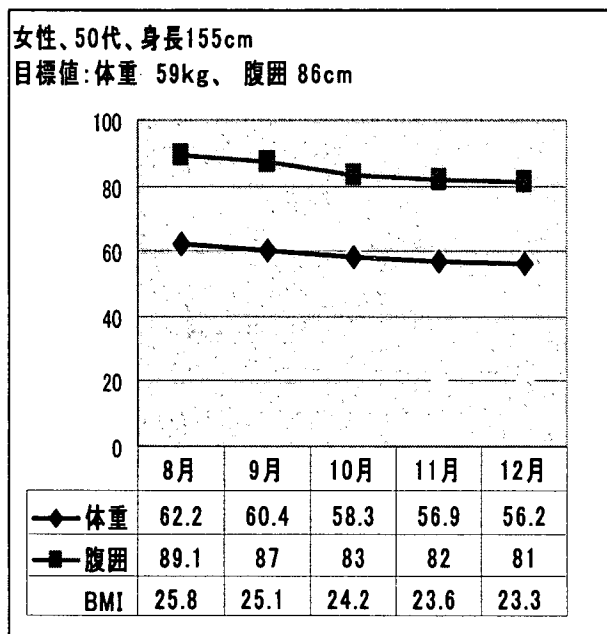
<食習慣>

- ・ 摂取エネルギーを抑えた
- ・ 繊維質やカルシウムの摂取量を増やした
- ・ 味付けを薄味にした
- ・ 油を使わずに調理し、脂質量を減らした

<運動習慣>

- ・ 歩数を増やした
- ・ ジョギングを週3~4日するようになった

2) 身体測定値、検査データの変化



V. まとめ

2007年7月から12月にわたり、個人・グループ面談やメール・手紙・電話などによる支援により保健指導を行い、一定の評価が得られたといえる。

今回の対象者には、通院中、服薬中の方が含まれていたが、保健指導により生活習慣病が悪化するようなことはなく、食事や運動などの生活習慣を見直し、支援内容に沿ってできるだけ改善を試み、成功した方が多かった。また、肥満の解消や検査データの有意な改

善もみられた。これらの要因は、服薬によるもの、その他治療によるものなど、単純に生活習慣改善によるものとは断定できないが、肥満の解消については生活習慣改善の効果と考えて矛盾しないものとする。

平成 20 年度からは、特定健診・特定保健指導の実施となるが、今回の保健指導プログラム実施を参考に、より良い保健指導介入システムを構築する予定である。

ご参加いただいた対象者の皆様には、これからも改善された生活習慣を続けられるようお願いする。

## Health Promotion Policy in Japan

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### Abstract

The health reform program in 2006 was the biggest one for the last 30 years in Japan. According to the plan a nation-wide health promotion program for healthier population will be introduced. As a main program of health promotion, the specified health checkup and follow-up health guidance and intervention program will be introduced from 2008. This program is a Japanese disease management program. In 2006 the preliminary programs have been launched in the three prefectures (Chiba, Toyama, and Fukuoka) and several operational problems have been clarified. In this article the author presents the general feature of program and some critics for it.

**Key words:** Healthy Japan 21, Health reform 2006, health promotion, Japan

### ❖ Introduction

Along with the socio-economic development, the Japanese disease structure has changed from the acute diseases dominant to the lifestyle-related chronic diseases dominant pattern. Lifestyle-related diseases are defined as the group of diseases in which such lifestyle as the habits of eating, exercise, rest, smoking and drinking contribute to their outbreak and development.

Today the life style related diseases account for two third of death, one third of health expenditures in Japan (Table 1)<sup>1)</sup>. The Ministry of Health, Labor and Welfare (MHLW) estimated that the total health expenditures will increase from 34 to 65 trillion yen from 2007 to 2025<sup>2)</sup>.

The MHLW has published the Health care reform plan in 2006. The plan stresses the two programs in order to rationalize the health expenditures; reform of health services delivery system and health promotion.

Received: December 27, 2006

Accepted: May 16, 2007

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For the health promotion, the new law will introduce “the specified health checkup and intervention program” for insureds over 40 years old obligatory for public health insurers from April, 2008. The main target of the specified health check-ups is so called Metabolic Syndrome. It is planned that the insured are to be stratified into 3 groups for the following health promotion programs according to the checkup results.

In this article, the author explains the background and overview of this new program.

### ❖ Health Promotion Activities in Japan

The health promotion activities are not recent one in Japan. In fact, Japan has made much effort for health promotion compared with other developed countries. However, the effect of such activities has not been systematically reviewed. This is one of the reasons why MHLW will introduce “the specified health checkup and intervention program”. Before explaining the new program, the author explains the current system.

One of the characteristics of Japanese health system is that various health promotion activities are organized under the different schemes. The followings are such programs.

a) Health and medical service law for the elderly:

Table 1 Health expenditure by disease category (2003)

(100 million yen)

	Total	In-Patient	Out-Patient
Total	240,931	117,231	123,700
I Infectious and Parasite Diseases	6,255	2,204	4,051
II Neoplasm	29,724	20,644	9,080
III Diseases of blood, blood forming organs and immune system	1,254	532	723
IV Endocrine, nutritional and metabolic diseases	17,019	4,876	12,143
Diabetes Mellitus	11,465	4,182	7,282
V Mental and behavioural disorders	18,281	13,699	4,582
VI Diseases of the nervous system	6,729	4,614	2,114
VII Diseases of the eyes and adnexa	9,746	2,410	7,335
VIII Diseases of the ear and mastoid process	1,912	350	1,562
IX Diseases of the circulatory system	53,039	27,308	25,731
X Diseases of the respiratory system	20,766	7,110	13,655
XI Diseases of the digestive system	15,610	7,739	7,871
XII Diseases of the skin and subcutaneous tissue	4,418	648	3,770
XIII Diseases of the musculoskeletal and connective tissue	16,662	6,025	10,637
XIV Diseases of the genitourinary system	17,882	4,934	12,948
XV Pregnancy, childbirth and the puerperium	2,017	1,632	386
XVI Certain conditions originating in the perinatal period	808	766	42
XVII Congenital malformations, deformations and chromosomal abnormalities	841	570	271
XVIII Signs, symptoms and abnormal clinical and laboratory findings, not elsewhere classified	2,383	1,113	1,270
XIX Injury, poisoning and certain other consequences of external causes	15,585	10,057	5,528

Source: MHLW (2005)

According to the Health and Medical Service Law for the Elderly, the municipality is required to organize various kinds of preventive activities and health promotion programs. These activities include annual health check up, health education, community rehabilitation services, home visit by public health nurses.

- b) Health insurance law: The Health Insurance Law recommends for each insurer to organize preventive activities. According to this recommendation, most of the insurers organize various preventive activities such as cancer screening program, for their insured and dependant family members. In the most of cases, these services are provided at the moment of annual health check up program mandated by the Occupational Safety and Health Law (see below).
- c) Long term care insurance (LTCI) law: According to the LTCI law, the care services under the LTCI scheme are available only for the frail elderly assessed eligible. Besides these services, each municipality organizes preventive services for the elderly non-eligible for the LTCI scheme. Various preventive services, such as arrangement of hous-

ing condition and rehabilitation program are organized by LTCI insurers.

- d) Occupational Safety and Health (OSH) law: According to the OSH law, the employer has to organize the annual health check up program for the employees. The items of annual health check up are not limited to the occupational diseases, and include general health problems, such as hypertension, diabetes, hyperlipidemia, liver dysfunction. In fact, the most frequent abnormalities found in the annual health check up under the OSH law are hypertension and hyperlipidemia as shown in Table 2<sup>3)</sup>. According to the results of health check up, the OSH staffs organize various type of follow up services, i.e., health education, counseling, physical training, etc.
- e) School health law: According to the school health law, the director of each school has to organize the annual health check up both for children and teachers. However, only referral services to medical institution are organized as follow-up services under this scheme.

Although there are various programs of health



Table 2 Results of health check up under the OSH law (2003)

Item	Prevalence rate (%)
Acuity (1000 Hz)	3.5
Acuity (4000 Hz)	8.5
Chest X ray examination	3.4
Examination of sputum	1.6
Hypertension	11.9
Anemia	6.5
Liver dysfunction	15.4
Hyperlipidemia	29.1
Hyperglycemia	8.3
Urine glucose	5.1
Urine protein	3.2
Erectro-Cardiogram (ECG)	8.9
Person with any abnormal results	47.3

Source: MHLW (2005)

promotion in Japan, there is no systematic coordination among these programs. Thus, the contents of programs are different and transfer of information from one to another is very difficult. This situation has long been criticized as an obstacle of life-long health management. The health reform 2006 intends to ameliorate this situation.

### ❖ Healthy Japan 21

Besides the various health check-up programs mentioned above, the Japanese government has been engaging in the health promotion programs from 1978 at population level in order to extend healthy longevity. For example, MHLW has published a series of guidelines for healthy life, i.e., exercise, diet, and rest. Currently, a new eleven-year plan from 2000 to 2010, the National Health Promotion Movement in the 21<sup>st</sup> Century, so called Healthy Japan 21 is on going. Figure 1 shows the general perspective of the plan. The most important point of plan is that it sets a series of concrete indicators to be attained; i.e., the rate of obese men between 20 to 60 years old < 15%, and that it requires the monitoring and periodical evaluation of project.

Regardless of the governmental initiative for health promotion, health status of the Japanese has not been ameliorated. The government conducts the National Life-style survey and the National Nutritional survey periodically. The results of 2003's Nutritional survey clarified that 30% of men between 40 and 60 were obese<sup>4)</sup>.

One of the important objectives of the "specified health checkup and intervention" program is to ameliorate this situation.

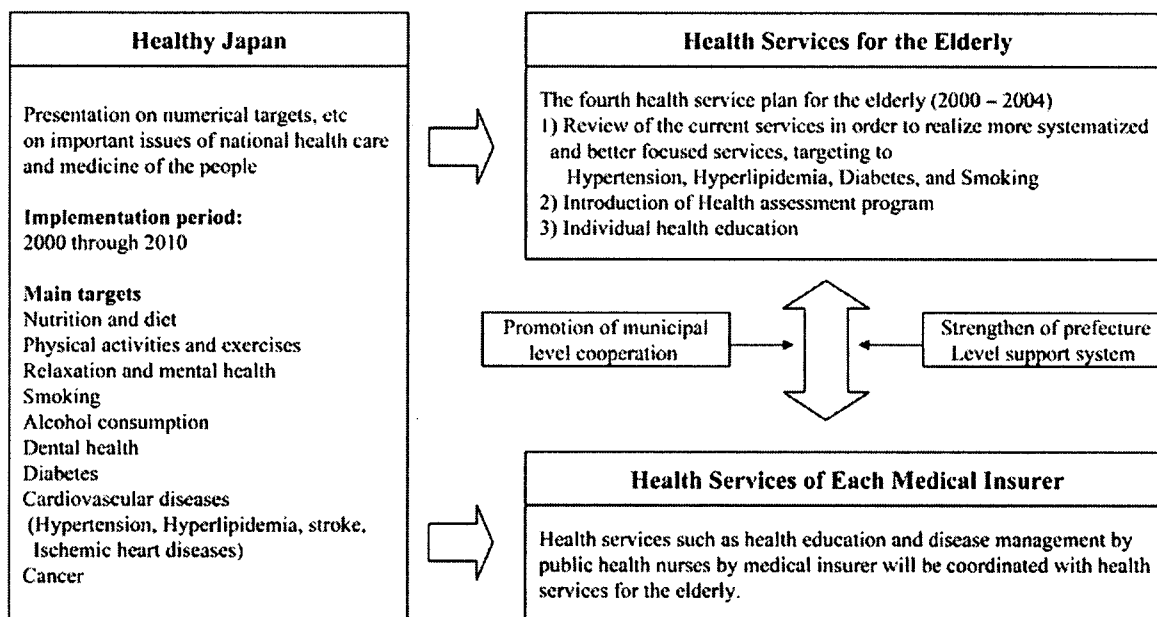


Figure 1. Healthy Japan and promotion of integrated health care service

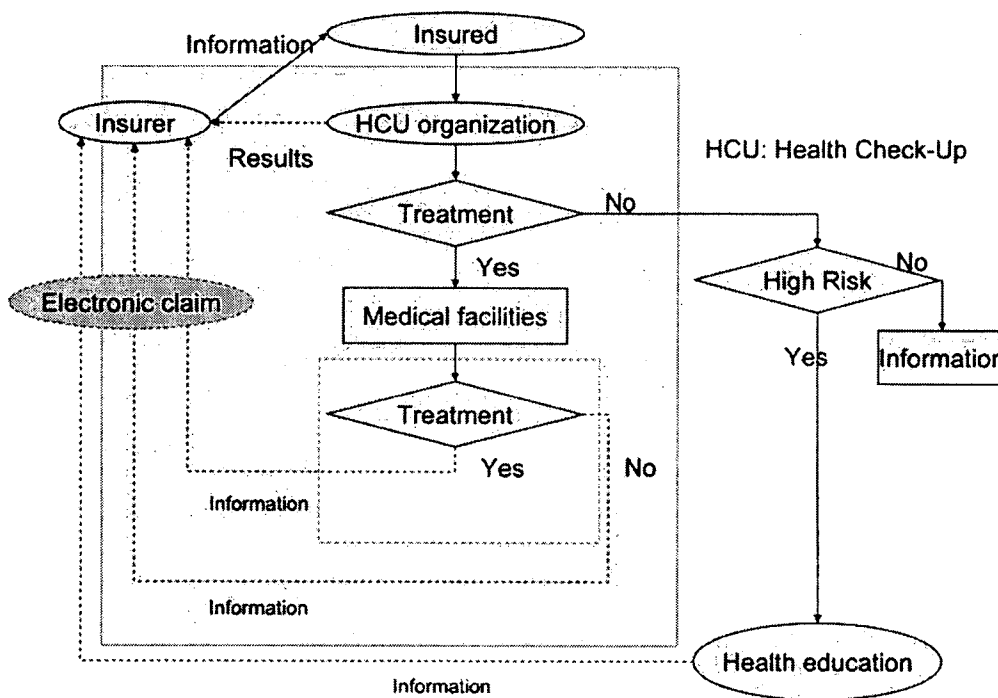


Figure 2. New health check-up program for life-style related diseases from 2008

#### ❖ Health Care Reform 2006 and the “Specified Health Checkup and Intervention” Program

The health care reform program in 2006 is regarded as a turning point of the Japanese health policy. The plan intends to make the health system more efficient and sustainable. For this purpose the plan clarifies the three main programs. The first is to facilitate the differentiation of medical institution and networking among them, and reduction of hospital beds. The second is to implement a nation-wide health promotion program. And the last is to create a new health insurance system for the elderly.

As a main program of health promotion, the specified health checkup and follow-up health guidance and intervention program will be introduced from 2008. Figure 2 shows the system. All public health insurers have to organize health check-up and the following health promotion programs for the insured over 40 years old. The main target of screening is “Metabolic syndrome”.

Figure 3 shows the criteria of syndrome. A standardized computer program is developed for the stratification of recipients. The insured will be categorized

into one of three levels according to their risk level; active support required, giving incentive required, only information required. If an insured is evaluated as active support required or giving incentive required, he/she must follow a standardized disease management program that is offered by the health support organization contracted with the insurers. The health support organization is a health institution that offers health education and other health support services. Persons in charge of health support programs must be health professionals such as doctor, public health nurse, dietician, and etc. It is important to know that this institution is not a medical facility regulated by the Medical Service Law. Thus for-profit private organizations can enter into this new health market.

It is very important to recognize that this new program is the e-claim project. It is obligatory for insurers and service providers to transfer the data by the electronic information of standardized format. It is planned to generalize the e-claim system for all medical services from 2011. If this program is successfully implemented, it becomes possible to evaluate the effect of health promotion activities on health expenditures.

It is planned that the outcomes of this program is

published by eight academic societies(\*) in April 2005:

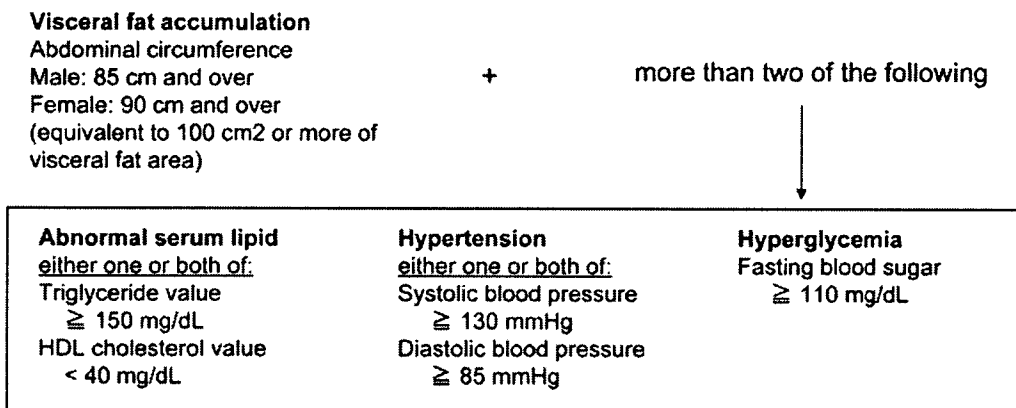


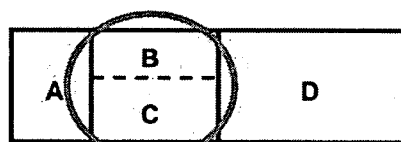
Figure 3. Diagnostic criteria of Metabolic Syndrome in Japan

- \* It is desirable to measure the amount of visceral fat by methods such as CT scans.
- \* The abdominal circumference should be measured at navel height with light breathing while standing. If there is obvious fat accumulation and the navel points downward, the circumference should be measured at mid-level between the subcostal edge and the anterior interspinal line.
- \* If an individual is diagnosed with metabolic syndrome, a glucose tolerance test is recommended, although not necessary, for the diagnosis.
- \* If an individual is receiving medication for hypertriglyceridemia, decreased blood HDL-C, hypertension, or diabetes, this should be noted as respective items.

Eight academic societies(\*): the Japan Society for the Study of Obesity, the Japan Atherosclerosis Society, the Japan Diabetes Society, the Japanese Society of Hypertension, the Japanese Circulation Society, the Japanese Society of Nephrology, the Japanese Society on Thrombosis and Hemostasis, the Japanese Society of Internal Medicine.

**New independent social insurance scheme  
 for the elderly with age 75 years old and over**

- A: premium 10%
  - B: health insurers (base)
  - C: health insurers (contribution)
  - D: Government 50%
- } 40%



**Financial Contributions:**

The amount of contribution by each health insurer will be adjusted to reflect the performance of specified health checkup and intervention measures within a range of +/- 10%.

Figure 4. Incentive system for health promotion

reflected to monetary contribution of each insurer for the newly created health insurance scheme for the elderly as shown in Figure 4. The amount of contribution by each health insurer will be adjusted to reflect the performance of specified health checkup and inter-

vention measures within a range of +/- 10%. In the case of insurer with 10,000 insured between 0 and 74 years old, this difference will be about 70 million yen.

In 2006 the social experiments were conducted in the three prefectures (Chiba, Toyama, and Fukuoka).

According to the preliminary results, several operational problems have been identified. The first is the number of persons who are evaluated as active support required or giving incentive required. The preliminary results indicated that about 50 to 60% of insured were evaluated into these two categories. It will be impossible to offer appropriate health promotion services for such many peoples from the viewpoint of human capacity and budget. According to the fact, the stratifying logic has been modified and the percentage of above mentioned two categories has dropped to 20–30%.

The second is the difference in items of health check-up programs among different schemes. For example, the health check-up program in occupational setting does not include LDL cholesterol nor measurement of the waist circumference. To make the system harmonized, the rearrangement of health check-up system is necessary which requires extra investment for all insurers.

These problems have been discussed in the national committee and several modifications were done for the final program. All medical insurers must prepare for the program within 2007 according to the official program manual.

## ❖ Conclusion

Currently there are many debates and critics on effectiveness of the “specified health checkup and intervention” program. According to the previous articles, for example, the health promotion activities are not considered effective for reducing the life-long health expenditures because one consumes most of the health expenditures within the last year of life<sup>5)</sup>. Referring to these kinds of results, several researchers questioned the cost-containment effect of the new program<sup>6, 7)</sup>.

However, the CDC estimated that obesity-attributable medical cost expenditures reached \$75 billion in 2003 and that taxpayers finance about half of these cost through Medicare and Medicaid<sup>8)</sup>. This fact suggests that prevention of obesity must be effective for reduction of medical expenditures.

Considering the efforts of pharmaceutical companies to develop new innovative drugs for life-style related diseases, such as diabetes melitus, hypertension, and hyperlipidemia, theoretically, the primary

prevention of metabolic syndrome will have a cost-containment effect.

Furthermore, it will be misleading to value the health promotion program from the effect on health expenditures. The value of health cannot be limited into such a narrow perspective.

According to the ILO report, the Japanese elderly are highly motivated to work and the actual employment rate among the elderly is very high compared with other developed countries; 74.8% of men of age 60 to 64, 35.9% of men of age 65 and more, 40.1% of women of age 60 to 64, and 15.2% of women of age 65 and more, were working in 1998<sup>9)</sup>. Economic needs are not the only reason for the elderly to work. According to the survey conducted by MHLW, about fifty percent of the elderly replied that they wanted to work in order to maintain their health and to have fulfillment in life<sup>10)</sup>.

Seike and Yamada have clarified that there are three important factors for the elderly to be able to continue to work based on their field study; that is, vocational skill, distance between residence and work place, and finally health<sup>11)</sup>.

Health promotion activity will assist for the Japanese to stay active during their aged life and to realize their fulfillment. It is also possible that the new program will facilitate for the senior to continue to work and indirectly to contribute to the social security finance.

The introduction of specified health checkup and intervention program is a social experiment for the public health policy. Thus, it must be evaluated for the effectiveness and efficacy, and the contents must be modified if necessary. The mid-term evaluation of the program is planned in 2011.

Although the author evaluates the necessity of new program, there are many points to be modified in order to make it more practical and feasible. For example, the current plan requires that the initial follow-up intervention must be a face to face type and be for more than 20 minutes for each insured. Considering the number of insured evaluated as “health guidance required”, the human resources in charge of health education is not enough. More cost-effective way of intervention will be necessary.

Actually we are developing such a web-based system for health education. We would like to introduce our system in the following literatures.

## ❖ Acknowledgement

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A part of this study was supported by an unrestricted grant from The Merck Company Foundation, Whitehouse Station, NJ, USA.

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# The Feasibility analysis of Disease Management Programs in Japan

## —The Literature Review in the Occupational Health Setting—

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### Abstract

In May, 2006, the Ministry of Health, Labor and Welfare published a part of the results of the Comprehensive Survey of Living Conditions of the People on Health and Welfare 2005. The report has clarified that one of two men and two of five women from 40 to 74 years old are regarded as the Metabolic syndrome or suspicious cases. In order to counteract these situations, much concern is given for the Disease management programs that have been developed in the USA. In Japan, traditionally a various health promotion activities have been organized in the occupational setting under the Occupational safety and Health Law. These activities can be regarded as disease management (DM) programs. In this perspective, the authors have conducted a literature review about health promotion programs conducted in the occupational setting. The authors have reviewed 30 articles by the formative evaluation using DM concept. In fact there were many DM like programs conducted in the Japanese workplaces. However, it is very difficult to develop the effective DM program directly from these experiences under the actual situation. The most important problem to be solved is the fact that there is no standardized methodology for intervention and evaluation. The authors concluded that it might be pragmatic to develop the Japanese DM programs based on the experiences in occupational settings with combination of the American sophisticated DM framework.

**Key words:** disease management, life-style related diseases, metabolic syndrome, occupational health

### ❖ Introduction

In May, 2006, the Ministry of Health, Labor and Welfare published a part of the results of the Comprehensive Survey of Living Conditions of the People on Health and Welfare 2005. The report has clarified that one of two men and two of five women from 40 to 74 years old are regarded as the Metabolic syndrome or suspicious cases. The definition of Metabolic Syn-

drome is as follows:

- 1) Visceral fat accumulation (the indispensable condition)  
Abdominal circumference is 85 cm and more for men and 90 cm and more for women.
- 2) More than two situations of followings;
  - i) Hypertension
  - ii) Hyperlipidemia
  - iii) Hyperglycemia

This result was very shocking and so that the MHLW has decided to strengthen the health programs for metabolic syndrome from 2008.

Regarding this situation, many health business organizations have been concerned about the possibility of Disease Management programs in Japan. Traditionally health related programs have been strictly

Received: January 5, 2007

Accepted: May 16, 2007

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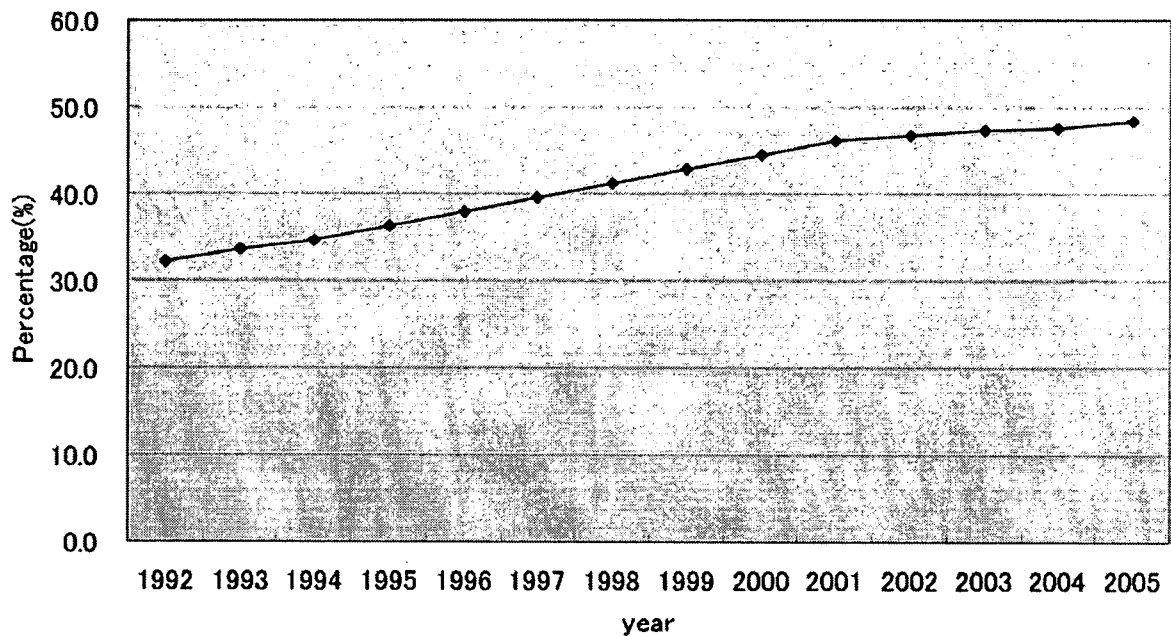


Figure 1. The percentage of abnormal data

limited to health professionals in Japan. However, the new law on health promotion programs in 2006 indicates that the health education programs for the persons with Metabolic syndrome can be offered by qualified private health business organizations, such as Disease Management (DM) companies under the direct contract with insurers. The Japan Medical Association presents the strong warning for such programs because of quality issues. It expected, however, that the privatization of health promotion activities will be promoted within the coming few years and that health related business will be developed in Japan.

The DM programs have been more developed in USA. The DMAA defined the Disease Management as follows:

“DM is a system of coordinated health care interventions and communications for populations with conditions in which patient self-care efforts are significant.” The role and the feature of DM is “to support the physician or practitioner/patient relationship and plan of care”, “to emphasize prevention of exacerbations and complications utilizing evidence-based practice guidelines and patient empowerment strategies,” and “to evaluates clinical, humanistic, and economic outcomes on an on-going basis with the goal of improving overall health.” And the basic processes of DM are identification, assessment, stratification,

intervention, measurements, and continuous reassessment.

It has been clarified that such DM programs are useful for amelioration of QOL of chronically ill-patient, prevention of aggravation of disorder and finally reduction of medical expenditures. In fact, the CMS (Center for Medicare and Medicaid Services) has adopted some DM programs for the purpose of reduction in medical expenditures. Thus it is very reasonable that many Japanese insurers are conscious about DM programs.

#### *The present situation of Occupational Health Programs in Japan*

Recently, the number of workers who have some lifestyle related diseases has been increasing in Japan. The background factors of this phenomenon are the westernization of Japanese society and ageing. The recent annual report on Occupational Safety and Health has indicated that the percentage of worker with abnormal data in the annual health checkup was 48.4% in 2005. This means that half of the workers have some kinds of health problems. Further more, this average has been increasing year by year (Figure 1). As shown in Table 1, the lifestyle related diseases are the most frequently detected abnormality, such as hyperlipidemia (29.35%), hypertension (12.29%),

Table 1 Results of health check up under the OSH law (2000)

Item	Prevalence rate (%)
Physical examination	3.2
Acuity (1000 Hz)	4.4
Acuity (4000 Hz)	9.7
Chest X ray examination	2.7
Examination of sputum	1.1
Hypertension	9.3
Anemia	6.0
Liver dysfunction	13.1
Hyperlipidemia	22.0
Urine glucose	3.4
Urine protein	3.0
Electro Cardiogram (ECG)	8.3
Person with any abnormal results	39.5

Source: MHLW (2003).

hyperglycemia (8.30%), and liver dysfunction (15.57%).

According to the Occupational Safety and Health Law (enacted in 1972), the occupational health staffs have to organize a various kind of health education programs for such workers with abnormal data.

The new law requires that OSH professional also actively contribute to the action against the metabolic syndrome. The MHLW tries to develop a standardized program for this purpose. In the case of Japan, however, we have to review the past experiences of

health promotion activities that have been conducted under the different settings. Especially, we think that the annual health checkup and the following health education programs in the Japanese occupational setting, can be regarded as the Disease Management.

So that we have reviewed the previous literatures about health promotion programs in the occupational setting in order to summarize a proposal on the Japanese Disease Management Programs.

### ❖ The Literature Review in the Occupational Health Setting —Method and Result—

We have reviewed all the articles included in the Journal of Occupational Health from 2002 to 2005, including the supplements for annual meeting of the Japan Society for Occupational Health. We have evaluated the articles according to the three basic processes and main activities of Disease Management as shown in Figure 2.

In total 30 cases were reviewed and summarized as shown in Table 2—target diseases, the object number of people, how to grasp the object people, presence of randomization, presence of control, how to intervention, index of appraisal, and result<sup>1-30</sup>). A various kind of health promotion programs have been organized in the Japanese workplaces. The life-style related diseases such as Hypertension, Diabetes Mel-

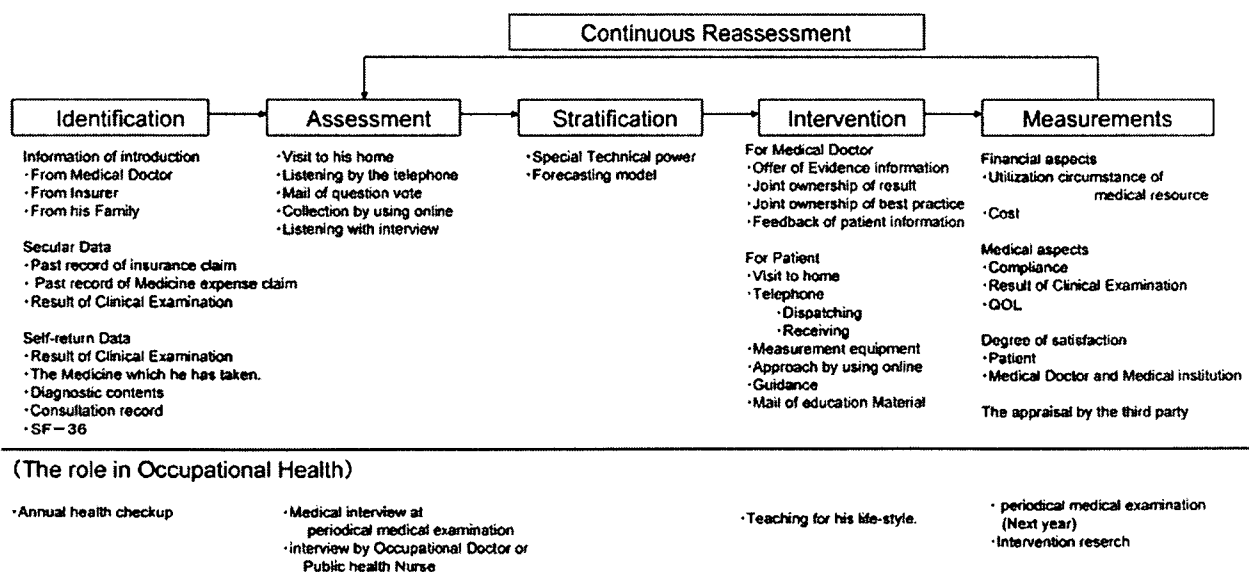


Figure 2. The basic processes and main activities of Disease Management —Compared with Occupational Health—



litus, hyperlipidemia, obesity are major targets.

As most of the programs have been conducted in relatively small workplaces, it is very difficult to evaluate the effectiveness of the programs.

According to the results of current review, it seems that it must be very difficult to develop the effective DM program directly from these experiences. The most important problem to be solved is the fact that there is no standardized methodology for intervention and evaluation.

### ❖ Conclusion

The health reform program in 2006 was the biggest one for the last 30 years in Japan. According to the plan a nation-wide health promotion program for healthier population will be introduced. As a main program of health promotion, the specified health checkup and follow-up health guidance and intervention program will be introduced from 2008. This program might be a Japanese Disease Management program.

It is no doubt that the Disease Management programs developed in USA will be applicable and effective for the Japanese situation. However, it is very important to know that various health promotion activities have been organized under the different schemes in Japan. Especially the experiences in the occupational setting are very precious and suggestive. Before introducing the American methodology, we have to review the past experiences under the DM concept. As shown by Ito in this volume<sup>31)</sup>, it is reasonable to use the current occupational setting for the implementation of the Japanese Disease Management programs because of its enough experiences in operation of programs. However, the most important weak-point of Japanese experiences is the lack of standard for intervention and evaluation. The new law 2006 plans to establish such standards.

Considering the actual situation, the authors think that it might be pragmatic to develop the Japanese DM programs based on the experiences in occupational settings with combination of the American sophisticated DM framework.

### ❖ Acknowledgement

This study was conducted by a Health and Labor Sciences Research Grants of Ministry of health, Labor

and Welfare (Comprehensive Research on Cardiovascular and Life-style related Diseases).

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Table 2 Results of literature review in the occupational health setting

Case*	Target Disease	N	Object			Intervention Method	Result	Indicator for evaluation
			Method of selection	Randomization	Control group			
1	Hypertension	2792	Annual health checkup			<ul style="list-style-type: none"> <li>• Check sheet for Blood Pressure</li> <li>• Check sheet for life-style</li> <li>• e-Mail</li> </ul>	The percentage of participation is 26.9%. The percentage of completing curriculum is 46.0%. 35.1% of completed persons were changed his Blood pressure to normal. The most important reasons for not-participation is difficulty of measurement. With easier systems, it will be possible to apply this program for more target people efficiently.	Blood Pressure
2	Hypertension	285 (Effective reply 149)	Annual health checkup			• Health education	When we compared before and after attendance of the lecture, consciousness increase was observed for 80% of participants in all stage of the health belief model. The level of perceived severity was originally high for the participants in the contemplation stage and action stage. The participants in the precontemplation stage (30 people) felt the necessity to change their life-style. Finally the participants in the contemplation stage and action stage have increased for 85 and 64 peoples, respectively.	Health belief model
3	Hypertension	236	unclear		+ Program completion level	• Individual health education (2 times per month)	For blood pressure level, sex distribution, and age distribution, there were no differences among the groups before intervention. After ten months intervention, the average blood pressure was changed from 148.1/88.5mmHg to 139.4/82.1mmHg for full participation groups ( $p<0.001$ ). For the group with only one time intervention, the average blood pressure was changed from 147.0/87.6mmHg to 141.6/83.4 mmHg ( $p=0.001$ ). In both group the modification of lifestyle was observed as follows: there were improvements in 3 of 11 eating habits items, and 2 of 5 physical examination items. Sleeping duration was extended. The fatigue and stress level were decreased. In the case of full participation group, more improvement was observed for diet habit, fatigue and stress, and total score of healthy lifestyle and subjective health score.	Blood Pressure, life-style
4	Hypertension	200	Annual health checkup		+ Existence of follow-up intervention	• Follow up intervention for Blood Pressure	The number of follow-up group and control group were 96 and 79 peoples, respectively. Significant improvement was observed for follow-up intervention group. The persons who modified their lifestyle healthier were 68.7% for follow-up intervention group and 59.5% for control group ( $p<0.05$ , chi-squared test).	Blood Pressure, life-style
5	Hypertension	133	Annual health checkup	+	+ (Setting for 3 groups)	<ul style="list-style-type: none"> <li>• Guidance for healthier life-style</li> <li>• Guidance for healthy life-style and distribution of the urine test paper for sodium concentration</li> <li>• Without any intervention</li> </ul>	The systolic blood pressure was decreased in all three group. The group with health guidance and urine check has shown the largest decrease in systolic blood pressure (12mmHg).	Blood Pressure

Case*	Target Disease	N	Object			Intervention Method	Result	Indicator for evaluation
			Method of selection	Randomization	Control group			
6	Hyperlipidemia	91	Annual health checkup		+ (program participants and non-participants)	<ul style="list-style-type: none"> <li>Health education</li> <li>Follow up monitoring by e-mail</li> </ul>	Participant was 68 peoples (74.7% of all persons with annual health check-up). There were no remarkable differences in the changes of labo-test and lifestyle between intervention and control groups.	Life-style Annual health checkup and medical interview
7	Hyperlipidemia	30	The member who take the classes about how to control the Cholesterol		Matched by age, the year of the classes, smoking habits, Total Cholesterol	<ul style="list-style-type: none"> <li>Health education, Walking class (1 or 2 times per month), health education letter</li> </ul>	In both group, total cholesterol level was improved after 6 months. The intervention group maintained the effect for three years. On the contrary, non-intervention group's data became worse after 1 year.	Serum Cholesterol
8	Cholesterol	1422	Annual health checkup			<ul style="list-style-type: none"> <li>Health education class and campaign for reducing cholesterol level</li> <li>Self check of physical activity by step counter</li> </ul>	Serum cholesterol level has decreased for both groups, but the participants group showed more decrease (Male: 8.2 vs 6.5, Female: 7.2 vs 5.6).	Serum Cholesterol
9	Hyperglycemia	46	Annual health checkup		+ (Setting for 3 groups; Improvement group, invariable group, get worse group)	Health education by Occupational Health Physician and Dietitian	According to the results of OGTT in June 1997 and January 1998, participants were categorized into the 3 groups; Improvement (15 peoples), No change (11 peoples), and Worsened (11 peoples). According to the results of annual health checkup in March 1999, the improvement group kept their well-controlled level, but other two groups showed worsened results. The result of March 2000 showed worsened data for all three groups.	OGTT
10	Glucose intolerance	30	Annual health checkup			Individual health education using following items: Laboratory data, Step counter, Health interview, Self check of blood sugar level, Body weight measurement, Check for dietary habits, Blood pressure measurement, Physical exercise with examination of physical fitness, Leaflet for healthy life, Measurement of waist and hip ratio	All the participants have completed the 6 months program. Six peoples have shown more than 10mg/dl decrease in FBS, and 2 peoples had shown more than 0.3% decrease in HbA1c. Significant improvements were observed for body weight, BMI, waist and hip ratio, and physical fitness test.	FBS, HbA1c, Total Cholesterol, Wt, BMI, W/H ratio, Blood Pressure, Physical fitness test