健康寿命の国際的な指標化に関する検討

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研究要旨　JA EHLEIS（健康・平均寿命情報システムに関する欧州共同事業）に参画して、国際的な指標化に関する検討を行うことが本研究の主目的である。併せて、日本における健康寿命の状況を海外に報告するとともに、国際的な健康寿命に関する動向を情報収集し、健康寿命の算定、活用に関する国際的ハーモナイゼーションを図ることを目的とした。2013 年 4 月に開催された会合において、健康日本２１（第二次）、健康寿命の将来予測の結果、欧州で算定されている健康寿命指標についての日本における値の推定結果、日本における所得及び学歴による平均寿命格差の推定結果についての報告を行った。また、新しい指標の開発に向けて提案を行うなど、議論に参画した。さらに、日本の健康寿命に関する情報について英語による発信をして欲しい旨の要望を得たため、健康日本２１（第二次）参考資料の健康寿命に関する部分について英語訳を行った。

Ａ．研究目的

　健康寿命は、健康日本２１（第二次）において、最も代表的な健康指標として採用されており、日本国内における都道府県別の比較や、また年次による推移が検討されている。健康寿命はもともと国際的に開発された指標であることから、国際的な比較を行うことにより、諸外国と比較した日本の特徴を明らかにすることができる。その結果は、これからの日本の保健施策を検討する上でも有用であると考えられる。

　一方、健康寿命は、健康日本２１（第二次）で使用されている「日常生活に制限のない期間の平均」や、「自分が健康であると自覚している期間の平均」の他にも、何を健康／不健康と定義するかによって、さまざまな指標の算定が可能である。どのような健康寿命が有用であるかについては、保健医療状況の変化など時代の変遷にともなって変わってくる可能性がある。そこで、JA EHLEIS（Joint Action European Health and Life Expectancies Information System、健康・平均寿命情報システムに関する欧州共同事業）では、国際的な連携によって、健康寿命をベースとした新しい総合健康指標の開発に取り組んでいる。

　この JA EHLEIS に参画して、国際的な指標化に関する検討を行うことが本研究の主目的である。併せて、日本における健康寿命の状況を海外に報告するとともに、国際的な健康寿命に関する動向を情報収集し、健康寿命の算定、活用に関する国際的ハーモナイゼーションを図ることを目的とした。

Ｂ．研究方法

　2013 年 4 月 17〜19 日に、フランス・パリにおいて開催された、JA EHLEIS（健康・平均寿命情報システムに関する欧州共同事業）に、参加の招聘に応えて参画した。日本の状況を報告するとともに、欧州及び米国での状況について情報収集し、新しい総合健康指標の開発に向けての検討を行った。さらに、プロジェクトリーダーである Dr. Jean-Marie Robine（Institut national de la santé et de la recherché médicale,

France、フランス国立衛生医学研究所）と日本
の健康寿命の状況について個別の意見交換を行
った。

　さらに、JA EHLEIS において、日本の健康
寿命に関する情報について、英語による発信を
して欲しい旨の要望を得たため、健康日本２１
（第二次）参考資料の健康寿命に関する部分に
ついて英語訳を行った。その他の日本における
健康寿命に関する情報についても、順次、英語
による情報発信を行っていく予定にしている。

Ｃ．研究結果

　2013 年 4 月に開催された会合において、日
本からの報告としては、本報告の後ろに掲載し
ている "Healthy Life Expectancies in Japan" と
"Concept for a new Global Disability Indicator"
の２本の報告を行った。"Healthy Life
Expectancies in Japan" においては、健康日本２
１（第二次）、前年度の「健康寿命における将
来予測と生活習慣病対策の費用対効果に関する
研究」班による健康寿命の将来予測の結果、欧
州で算定されている健康寿命指標についての日
本における値の推定結果、日本における所得及
び学歴による平均寿命格差の推定結果について
の報告を行った。なお、JA EHLEIS では欧州
各国の健康寿命について、「日常生活に制限の
ない期間の平均」（Global Activity Limitation
Indicator (GALI) に基づく Life expectancy
without activity limitation）、「慢性疾患の無い
期間の平均」（Life expectancy without chronic
morbidity）、「自分が健康であると自覚してい
る期間の平均」（Life expectancy in very good or
good perceived health）の３つの指標について、
毎年算定している。

　"Concept for a new Global Disability
Indicator" においては、事前にメール上で意見
交換し、作成された working paper などについ
ての議論を行った。事前の検討においては、
ICF (International Classification of Functioning,
Disability and Health) における参加

（participation）に焦点をあてた総合健康指標
の開発が重要ではないかという議論が出たため、
それを中心とした意見を報告した。また、現在、
欧州で使用されている３つの健康寿命指標につ
いて、改変の必要性の有無などについての意見
を述べた。また、参加に焦点をあてた指標とし
て「閉じこもり」または「社会的孤立」の指標
化についての提案を行った。

　なお、この会合には、EU 各国（20 か国＋
α）、欧州委員会（Eurostat、SANCO）、OECD
などの公衆衛生研究所・行政・大学関係者など
が参加した。EU 域外からは、米国（CDC）と
日本が招聘されて参加した。

　最後に、健康日本２１（第二次）参考資料の
健康寿命に関する部分の英語訳の結果について
は、本報告の後ろに掲載している通りである。
なお、この翻訳は、当分担研究班の責任におい
て行ったものであり、厚生労働省による公式訳
ではない。ただし、健康日本２１（第二次）
（厚生労働省告示第四百三十号（平成 24 年 7
月 10 日）国民の健康の増進の総合的な推進を
図るための基本的な方針）の公式訳で使用され
ている用語についてはそれに準拠して翻訳を行
った。

Ｄ．考察

　JA EHLEIS の会合において、日本と欧州の
健康寿命の比較を報告した際に、特にスウェー
デンとの比較で日本の平均寿命は長いのに対し、
健康寿命が短いことに対しては、日本における
延命治療などによる部分があるのではないかと
いうコメントが寄せられた。また、所得や学歴
による平均寿命格差の状況については、欧州と
比較して驚異的に格差が小さいというコメント
が寄せられた。

　会合における新しい総合健康指標の検討に関
しては、狭い意味での参加だけではなく、活動
（activities）なども含めたより広い ICF の概念
を考慮した指標とするのが良いのではないかと
の意見が出された。そのため、提案を行った閉

じこもりや社会的孤立などについてよりは、米国 CDC などで検討されている、activity of daily living (ADL)の要素に着目した健康寿命についての検討を深めてはどうかという意見などが出された。

　健康日本２１（第二次）参考資料の健康寿命に関する部分の英語訳については、その情報提供によって、日本における健康寿命の検討状況などについての国際的な理解が得られる一助になると考えられた。

Ｅ．結論

　JA EHLEIS（健康・平均寿命情報システムに関する欧州共同事業）に参画し、健康寿命の国際的な指標化に関する検討を行うと共に、日本と欧米との健康寿命の状況などについての情報交換を行った。

Ｆ．研究発表

１．論文発表
　なし

２．学会発表
1）T Ojima, S Hashimoto, I Tsuji, H Tsutsui, T Noda, M Nakamura, K Kondo, M Lagergren , H Van Oyen, JM Robine. Healthy Life Expectancy in Japan and comparison with EU. 6th European Public Health Conference. 13-16 Nov 2013, Brussels, Belgium. (Eur J Public Health 2013; 23(suppl1):44.)

Ｇ．知的財産権の出願・登録状況（予定を含む）

１．特許取得
　なし。

２．実用新案登録
　なし。

３．その他
　なし。

Healthy Life Expectancies in Japan

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Department of Community Health and Preventive Medicine,
Hamamatsu University School of Medicine, JAPAN

Contents

- *Governmental actions about healthy life expectancies in Japan*
- Selected results of the Research Group about Healthy Life Expectancy in Japan
- Preliminary results about healthy life expectancy in Japan
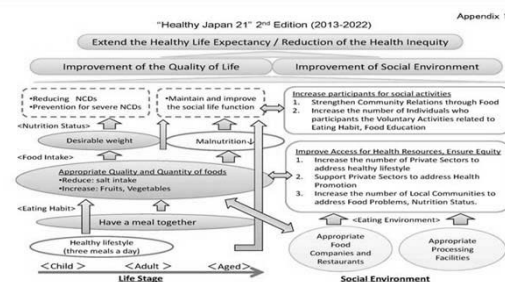

Health Japan 21 (2nd edition)

- Published as the Official Public Notice #430 of Minister of Health, Labour and Welfare Japan

  in July 10, 2012

  according to the Health Promotion Law

  Chair of the planning committee was Prof. Ichiro TSUJI in Tohoku University

  http://www.mhlw.go.jp/bunya/kenkou/kenkounippon21.html
  (in Japanese)

Four main concepts of the Health Japan 21 (2nd edition)

http://www.maff.go.jp/e/ccasia/18/pdf/as18_crd08e_appendix_1_item9_japan.pdf
(English chart)


Health Japan 21 (2nd ed) set 64 target indices

Target #1. Extend the healthy life expectancy
- More than the increase of life expectancy
- Healthy life expectancy without activity limitation from the data of the Comprehensive Survey of Living Conditions
- Healthy life expectancy by self perceived health should also be used as the supplemental indices

Target #2. Reduce the health inequity
- Measured by the gap of the healthy life expectancy between the 47 prefectures

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Gap between life expectancy (LE) and healthy life expectancy (HLE)
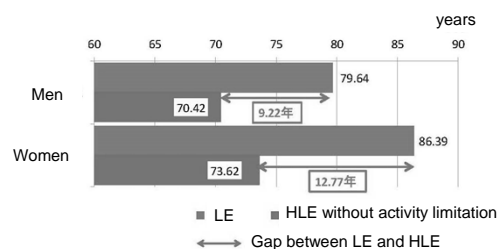
years

Men	79.64	70.42 — 9.22年
Women	86.39	73.62 — 12.77年

■ LE   ■ HLE without activity limitation
⟷ Gap between LE and HLE

Source: LE (2000): The life table by the Ministry of Health, Labour and Welfare
HLE (2000): The Research Group about Healthy Life Expectancy

Official supplemental paper for Health Japan 21 (2nd edition)

Slide 1

Time trend of life expectancy (LE) and healthy life expectancy (HLE)
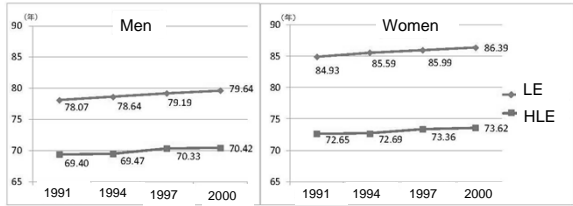
Men: 78.07, 78.64, 79.19, 79.64 (LE); 69.40, 69.47, 70.33, 70.42 (HLE)
Women: 84.93, 85.59, 85.99, 86.39 (LE); 72.65, 72.69, 73.36, 73.62 (HLE)
Years: 1991, 1994, 1997, 2000

Source: LE (2000): The life table by the Ministry of Health, Labour and Welfare
HLE (2000): The Research Group about Healthy Life Expectancy

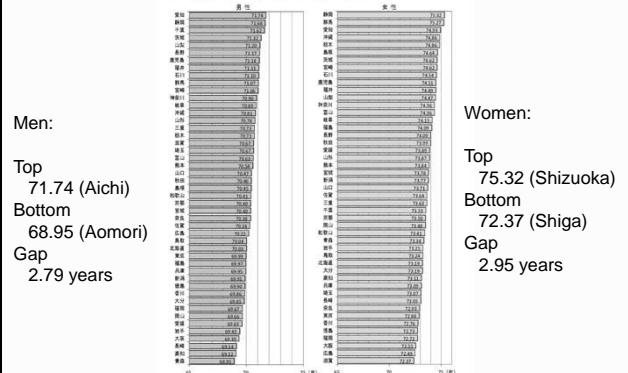**Official supplemental paper for Health Japan 21 (2nd edition)**

Slide 2

Healthy life expectancy without activity limitation by prefectures

Men:

Top
71.74 (Aichi)
Bottom
68.95 (Aomori)
Gap
2.79 years

Women:

Top
75.32 (Shizuoka)
Bottom
72.37 (Shiga)
Gap
2.95 years

Source: The Research Group about Healthy Life Expectancy

Official supplemental paper for Health Japan 21 (2nd edition)

Slide 3

Contents

- Governmental actions about healthy life expectancies in Japan
- *Selected results of the Research Group about Healthy Life Expectancy in Japan*
- Preliminary results about healthy life expectancy in Japan

Slide 4

Healthy Life Expectancies calculated by the research group

(1) Disability free life expectancy (without activity limitation)
日常生活に制限のない期間の平均
- Used for the Health Japan 21 (2nd edition)
- Using self-administered questionnaire data

(2) Life expectancy with self-perceived health
自分で健康であると自覚している期間の平均
- Using self-administered questionnaire data

(3) Disability free life expectancy (without care need)
日常生活動作が自立している期間の平均
- Using Long-term Care Insurance Data

* (1) and (2) are useful for national and prefectural level
(3) is especially useful for municipality level

Principal Investigator: Prof. Shuji HASHIMOTO in Fujita Health University

Slide 5

Question for activity limitation

Q6 Do you have any health problem which affect daily living now?
1 Yes   2 No

Q6-1 How is it affect ? Select all of applicable items.
1 Activity of daily living
2 Going out
3 Working, housekeeping, studying
4 Physical activities
5 Others

Used in the national Comprehensive Survey of Living Conditions conducted by the Ministry of Health, Labour and Welfare of Japanese government

Slide 6

Life Expectancy at age 0 and expected years in Japan

- Without activity limitation
- With activity limitation
(by the national Comprehensive Survey of Living Conditions questionnaire)

Women 73.6 — 12.8
Men 70.4 — 9.2

- in good, rather good, or ordinary perceived health
- in bad or rather bad perceived health

Women 73.3 — 13.1
Men 69.9 — 9.7

- Without care need
- With care need
(by the Long-term care Insurance Data)

Women 83.2 — 3.2
Men 78.2 — 1.5

Expected years

Life Expectancy at age 65 and expected years in Japan

- Without activity limitation
- With activity limitation
  (by the national Comprehensive Survey of Living Condition questionnaire)
- in good, rather good, or ordinary perceived health
- in bad or rather bad perceived health
- Without care need
- With care need
  (by the Long-term care Insurance Data)

Women 15.3 — 8.6
Men 13.1 — 5.7
Women 16.5 — 7.4
Men 13.7 — 5.2
Women 20.5 — 3.4
Men 17.2 — 1.6

Expected years (0 5 10 15 20 25)

Observed data and forecasting for healthy life expectancy without activity limitation
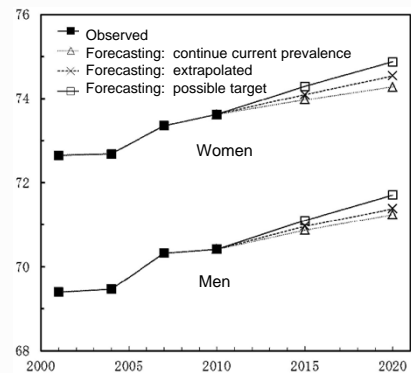
- Observed
- Forecasting: continue current prevalence
- Forecasting: extrapolated
- Forecasting: possible target

Women
Men

(2000–2020, 68–76)

Contents

- Governmental actions about healthy life expectancies in Japan
- Selected results of the Research Group about Healthy Life Expectancy in Japan
- *__Preliminary results about healthy life expectancy in Japan__*

Estimated Life Expectancy at age 65 and expected years in Japan

- Without activity limitation
- With moderate activity limitation
- With severe activity limitation
  (by GALI)
- Without chronic morbidity
- With chronic morbidity
- in good or rather good perceived health
- in ordinary perceived health
- in rather bad or bad perceived health

Women 13.4 | 6.3 — 4.2
Men 11.4 | 4.8 — 2.7
Women 9.4 — 14.5
Men 7.6 — 11.2
Women 4.9 | 11.6 — 7.4
Men 4.7 | 9.0 — 5.2
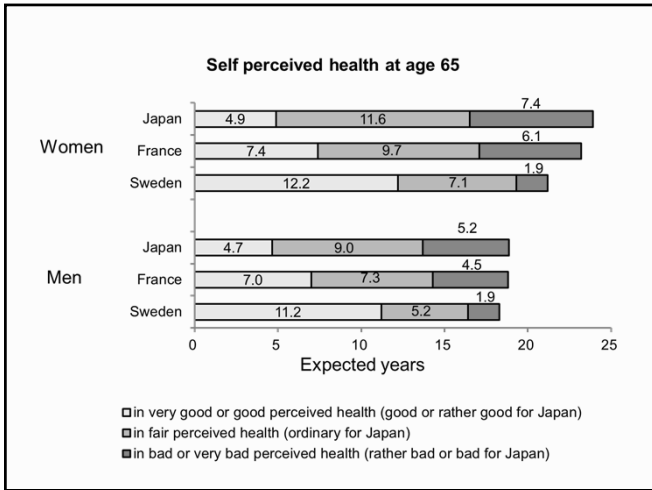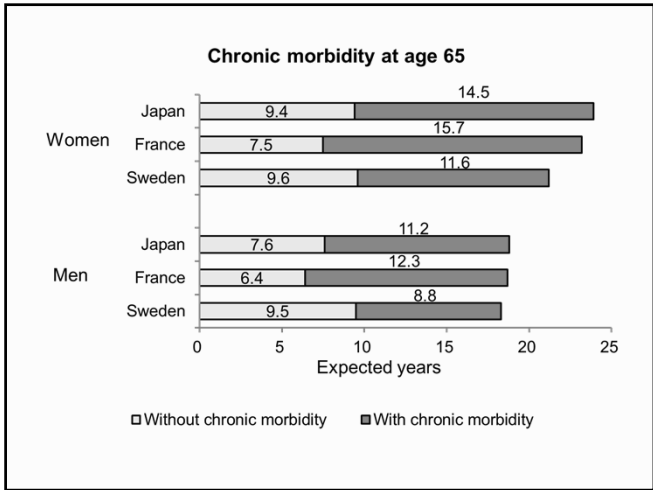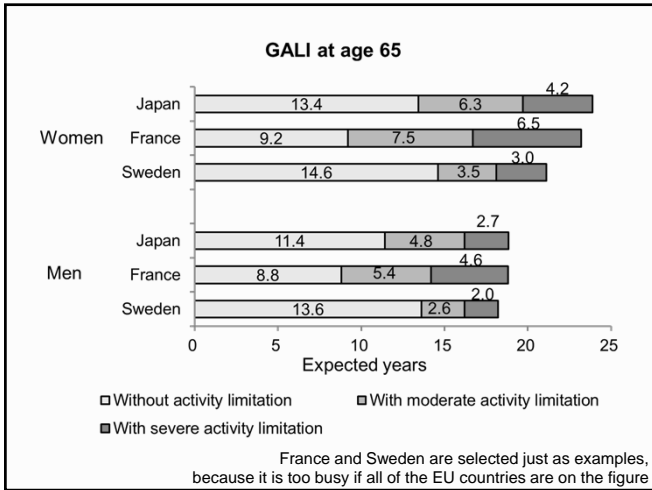
Expected years (0 5 10 15 20 25)
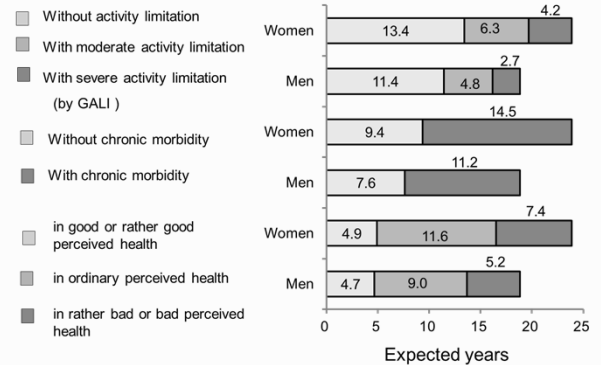
Methods of conversion

- Subjects: 2,700 randomly selected residents of 20+ years old in 6 municipalities in Shizuoka prefecture, Japan
- Self administered mail survey
- Response: 1,774 (66.0%)
- Questionnaire:
  - Activity limitation, the same as the Japanese national survey
  - Activity limitation by GALI
  - Chronic morbidity, the same as EU
  - Self perceived health, the same as the Japanese national survey
- Conversion table was made and applied to the national data
- Limitations
  - Not a nationally representative sample
  - Sample size might not be enough

Conversion table

Activity limitation (national Comprehensive Survey of Living Conditions qestionnaire)	Age group	Activity limitation (GALI)			
		With severe	With moderate	Without	Total
With	20-39	17.4%	34.8%	47.8%	100.0%
	40-64	22.2%	44.4%	33.3%	100.0%
	65-74	23.1%	50.0%	26.9%	100.0%
	75-	52.7%	35.1%	12.2%	100.0%
	Total	35.1%	39.9%	25.0%	100.0%
Without	20-39	1.2%	5.8%	93.0%	100.0%
	40-64	.7%	8.2%	91.0%	100.0%
	65-74	1.1%	13.9%	85.0%	100.0%
	75-	2.2%	25.0%	72.8%	100.0%
	Total	1.1%	10.8%	88.1%	100.0%

Results are almost same between men and women.
Conversion tables from self perceived health to chronic morbidity, and from activity limitation to chronic morbidity are also made.

GALI at age 65

Women
- Japan: 13.4 | 6.3 | 4.2
- France: 9.2 | 7.5 | 6.5
- Sweden: 14.6 | 3.5 | 3.0

Men
- Japan: 11.4 | 4.8 | 2.7
- France: 8.8 | 5.4 | 4.6
- Sweden: 13.6 | 2.6 | 2.0

Expected years (0, 5, 10, 15, 20, 25)

☐ Without activity limitation   ◨ With moderate activity limitation
■ With severe activity limitation

France and Sweden are selected just as examples, because it is too busy if all of the EU countries are on the figure

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Chronic morbidity at age 65

Women
- Japan: 9.4 | 14.5
- France: 7.5 | 15.7
- Sweden: 9.6 | 11.6

Men
- Japan: 7.6 | 11.2
- France: 6.4 | 12.3
- Sweden: 9.5 | 8.8

Expected years (0, 5, 10, 15, 20, 25)

☐ Without chronic morbidity   ■ With chronic morbidity

Self perceived health at age 65

Women
- Japan: 4.9 | 11.6 | 7.4
- France: 7.4 | 9.7 | 6.1
- Sweden: 12.2 | 7.1 | 1.9

Men
- Japan: 4.7 | 9.0 | 5.2
- France: 7.0 | 7.3 | 4.5
- Sweden: 11.2 | 5.2 | 1.9

Expected years (0, 5, 10, 15, 20, 25)

☐ in very good or good perceived health (good or rather good for Japan)
◨ in fair perceived health (ordinary for Japan)
■ in bad or very bad perceived health (rather bad or bad for Japan)

Comments

- GALI of Japan is around the midpoint between France and Sweden.
- Duration with chronic morbidity of Japan is long as France.
- Duration with bad health of Japan is longer than France and Sweden. Majority of Japanese are with "ordinary" health.

Life expectancies by the quantile of income

(70, 75, 80, 85, 90)

Quantile	Men	Women
Ⅰ (Low)	78.26	85.87
Ⅱ	78.33	86.24
Ⅲ	80.59	88.54
Ⅳ	79.21	85.87
Ⅴ (High)	81.76	86.11

Life expectancy by education attainment

(70, 75, 80, 85, 90)

Education	Men	Women
<6 years	77.4	85.12
6-9 years	78.91	86.12
10-12 years	80.32	86.86
13 years -	81.77	88.1
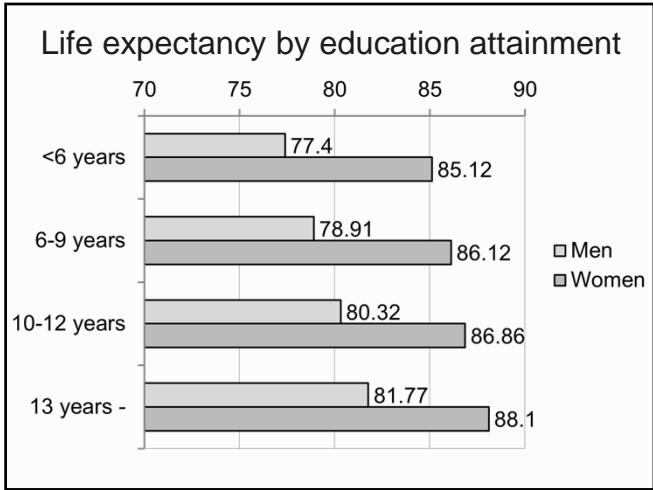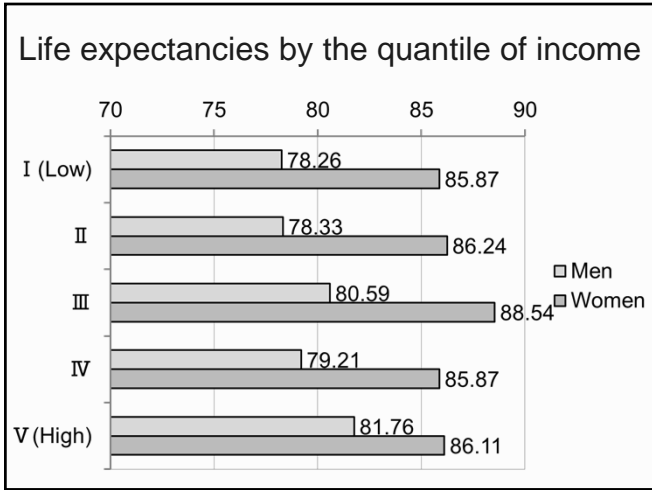
Methods of life expectancy inequality estimation

- Subjects: 21,047 community dwelling older people in 8 municipality in Japan
- Followed up 2 - 4.5 years
- Hazard ratios were calculated by quantile of income and education attainment
- These data are from the AGES project
- Applied to the national life table in 2000

Practices to reduce heath inequality and to extend the healthy life expectancy in Japan

- Community health promotion volunteers (86.8%)
- Salon or café for older people (67.0%)
- Following up children by public health nurses according to their household economic situation (65.5%)
- Community bus service by public sectors (59.1%)
- Providing healthy lunch and cooking education at elementary schools (almost 100%)

( ) : proportion of active municipalities

from the preliminary results of the Research Group about Social Determinants of Health and collaborated survey

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April 19, 2013

JA-EHLEIS seminar

Concept for a new Global Disability Indicator

Toshiyuki OJIMA, MD, DrPH

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Department of Community Health and Preventive Medicine,
Hamamatsu University School of Medicine, JAPAN

General comments

- Excellent working paper with comprehensive and detailed discussion
- Focusing on measuring participation of ICF is quite reasonable
- Scoring system according to the selected criterion is very useful.

Framework of health expectancies

Current set of health expectancies
1. GALI
2. Chronic morbidity
3. Perceived health

The working paper are discussing about criticism of GALI.

Problems of chronic morbidity and perceived health should also be discussed.

New framework of health expectancies

1. GALI ⟶ Change to a new indicator? Then, we should focus on *activity* limitation
2. Chronic morbidity
3. Perceived health

⟶ Add a new indicator as the 4th one? Then, focusing on *participation* might be meaningful challenge

Measuring *participation* would be important, because it is more affected by *social system* including interpersonal interaction and transportation than biological conditions.

Changing "chronic morbidity" to a new indicator might be another option.

Subcategories of "activities and participation" in ICF

1. Learning and applying knowledge ⎤
2. General tasks and demands
3. Communication ⎤ — Activity
4. Mobility
5. Self-care
6. Domestic life
7. Interpersonal interactions and relationships ⎦ — Participation
8. Major life areas
9. Community, social and civic life ⎦

Covering all of the subcategories of "activities and participation" would be quite difficult.
If we focus on "participation", "community, social and civic life" or "interpersonal interactions and relationships" would be useful.

Conclusion

- GALI would be a good indicator, even if it has some problems.
- If we use a new indicator instead of GALI, the new indicator should be focused on activity limitation like GALI.
- If we add a new indicator or change instead of chronic morbidity, "participation" would be a key concept.

Homeboudness

- We often assess homeboudness for older people in Japan.
- It is highly related to their health and life prognoses and a major risk factor
- It is a kind of objective behavioral measurement for participation
- Importance of going out might be sometimes questionable

Selected reference: Bruce ML, et al. Psychiatric status among the homebound elderly: an epidemiologic perspective. J Am Geriatr Soc 1992; 40(6): 561-566.

Questionnaire of homeboundness

- How often do you go out? (Going out include visiting neighbours, shopping, going to the hospital)

a. 4 times or more/week b. 2 or 3 times/week

c. once/week　　　　　　d. 2 or 3 times/month

e. a few times/year　　　f. do not go out

We regard people who go out less than once/week as homebound.

Another participation indicator

- If we focus on "participation" rather than activity, how about to consider "social isolation" ?

Developing a new indicator is a really meaningful challenge

Thank you!

Extension of healthy life expectancy and reduction of health disparities

in the Reference Material for Health Japan 21 (the second term)

i. Introduction

Healthy life expectancy is defined as the length of life that an individual lives without limitation in daily activities due to health problems. Extension of healthy life expectancy is given as one of the goals presented in Health Japan 21. At the time, however, clarity was lacking in the concept of healthy life expectancy and methods of estimating it, and no specific figure or goals for healthy life expectancy were presented.

With recent developments in research, however, there is growing consensus with regard to the concept of healthy life expectancy and methods of estimating it. Health Japan 21 (the second term) shows current figures for healthy life expectancy as well as how those goals are viewed.

ii. Basic philosophy

(i) Extension of healthy life expectancy

Extension of healthy life expectancy is a core issue in Health Japan 21 (the second term), and its inclusion as an indicator is essential to the program. Showing current figures for healthy life expectancy and regularly estimating subsequent changes are beneficial in managing the progress of a national health promotion movement.
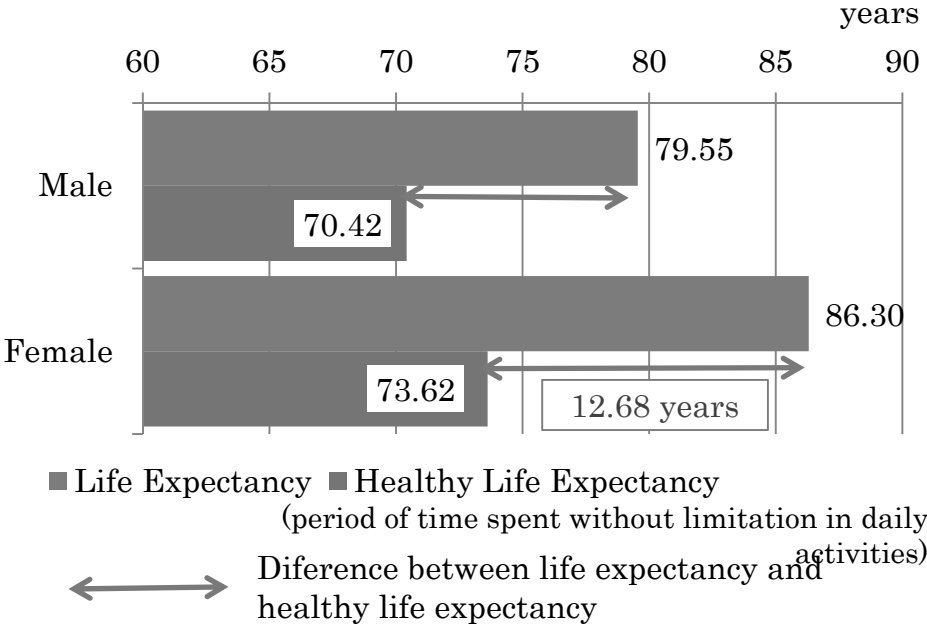
Various definitions of healthy life expectancy and ways of estimating it exist. First, with regard to the definition of healthy life expectancy, a mutually complementary evaluation is possible by taking the more objective "average period of time spent without limitation in daily activities" as the main index, and the more subjective "average period of time individual consider themselves as healthy" as a secondary index. Next, for the method of estimation, calculations based on Comprehensive Survey of Living Conditions data (disability-free life expectancy using the Sullivan method) are thought to be the most appropriate based on considerations of consistency and feasibility with current public statistics and other factors.

In setting target values, the focus is on the difference between life expectancy and healthy life expectancy. The difference between life expectancy and healthy life expectancy is the "unhealthy period" in which an individual spend with limitation in daily activities. The difference between life expectancy and healthy life expectancy (period of time spent without limitation in daily activities) was 9.13 years in men and 12.68 years in women in 2010 (Figure 1).

If this difference with healthy life expectancy grows as life expectancy increases, the period during which large expenditures for medical care and care benefits are consumed will become longer. If the difference between life expectancy and healthy life expectancy can be reduced by

preventing disease, promoting health, and avoiding the need for care, we can expect not only to prevent decreases in individuals' quality of life, but also to reduce the social security burden. It is very important that we approach this problem from the perspective of launching a new national health promotion movement that also contributes to a sustainable social security system.

Figure 1. Difference between life expectancy and healthy life expectancy

years

| 60 | 65 | 70 | 75 | 80 | 85 | 90 |

Male
79.55
70.42

Female
86.30
73.62
12.68 years

■ Life Expectancy ■ Healthy Life Expectancy
(period of time spent without limitation in daily activities)

Diference between life expectancy and healthy life expectancy

  (Sources: Life expectancy (2010): "Complete Life Table 2010" by Ministry of Health, Labour and Welfare; healthy life expectancy: Health and Labour Sciences Research Grants "Study on future predictions of healthy life expectancy and cost-effectiveness of measures to prevent lifestyle-related diseases")

(ii) Reduction of health disparities

    The health disparities are defined as differences in health status among a population due to region and socioeconomic status. Given that data on regional disparities are collected with considerable accuracy, and that effects can be expected when local governments advances their own independent efforts after identifying the gaps between themselves and other local governments, the focus in current plans is placed on regional disparities.

    For each local government, identifying and analyzing factors in the healthy life expectancy gap, and thinking of strategies to extend healthy life expectancy, are important in advancing health promotion.

    Various indices may be considered in elucidating existing health gaps between local

governments and strengthening efforts to close those gaps, but the most important is healthy life expectancy.

iii. Present status and goals

(i) Extension of healthy life expectancy

| Target measure	Average period of time spent without limitation in daily activities
Present status	Men 70.42 years, women 73.62 years (2010)
Goal	To extend healthy life expectancy more than increase of life expectancy* (2022)
Data source	Health and Labour Sciences Research Grants "Study on future predictions of healthy life expectancy and cost-effectiveness of measures to prevent lifestyle-related diseases" Note: Estimations based on Comprehensive Survey of Living Conditions

*To accomplish the above goals, not only the "average period of time spent without limitation" but "average period of time individuals consider themselves as healthy."

"Average period of time spent without limitation in daily activities" was calculated using the Sullivan method, with basic data taken from Comprehensive Survey of Living Conditions and Life Table (see the latter page for the calculation method). The figures used in current values were calculated based on the Health and Labour Sciences Research Grants "Study on future predictions of healthy life expectancy and cost-effectiveness of measures to prevent lifestyle-related diseases."

A comparison of period of time spent without limitation in daily activities (healthy life expectancy) between 2001 and 2012 revealed that it rose from 69.40 years to 70.42 years in men, an increase of 1.02 years, and from 72.65 years to 73.62 years in women, an increase of 0.97 years. Meanwhile, life expectancy during the period years rose from 78.07 years to 79.55 years in men, an increase of 1.48 years, and from 84.93 years to 86.30 years in women, an increase of 1.37 years (Figure 2).
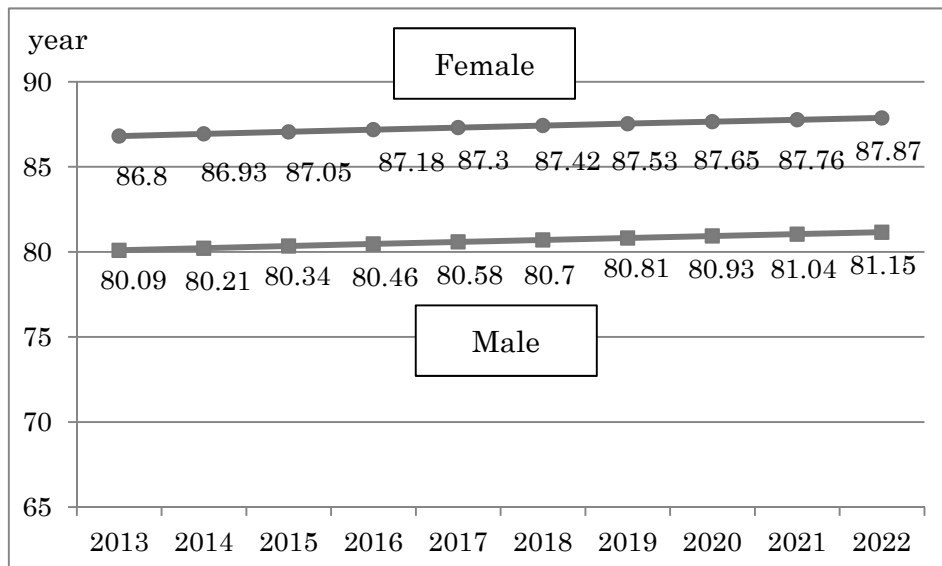
According to Population Projection of Japan (January 2012 estimates) by National Institute of Population and Social Security Research, life expectancy in the years from 2013 to 2022 is predicted to rise from 80.09 years to 81.15 years in men, an increase of 1.06 years, and from 86.80 years to 87.87 years in women, an increase of 1.07 years (Figure 3).

Figure 2. Trends in life expectancy and healthy life expectancy
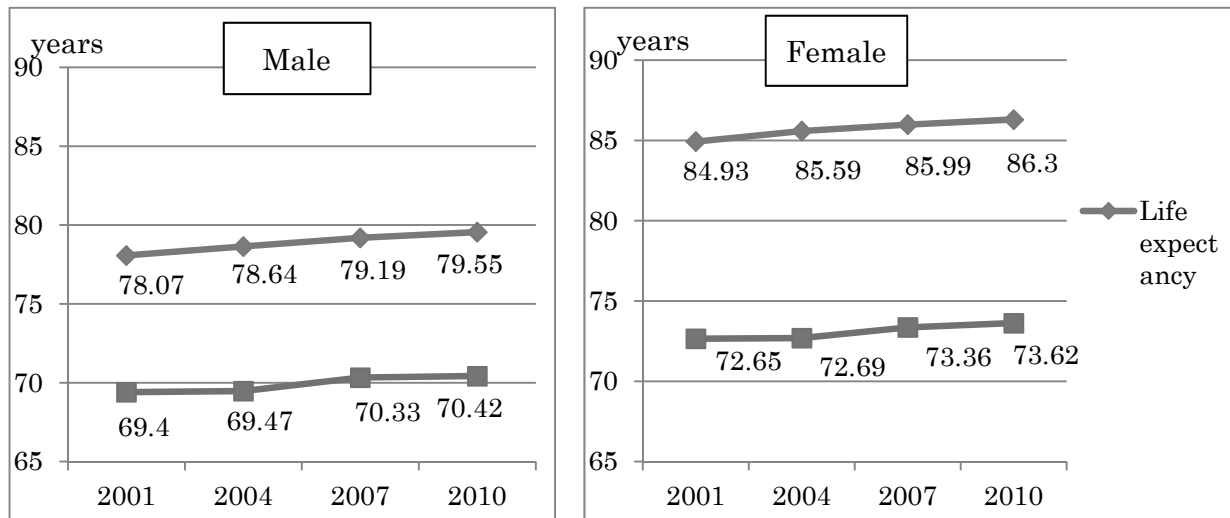
(Sources: Life expectancy: Ministry of Health, Labour and Welfare's "Abridged Life Table" in 2001, 2004, and 2007, "Complete Life Table" in 2010; healthy life expectancy: Health and Labour Sciences Research Grants "Study on future predictions of healthy life expectancy and cost-effectiveness of measures to prevent lifestyle-related diseases")

Figure 3. Life expectancy projection (2013–2022)

(Source: "Population Projection of Japan (January 2012 estimates)" by National Institute of Population and Social Security Research)

It is predicted that in the future not only the period of health but also the period of unhealth will become longer as life expectancy increases. Therefore, greater efforts to promote the health of citizens are important, so that the healthy life expectancy is extended by more than the increase of

life expectancy (delay the time when people reach an unhealthy state). In this way we can aim to shorten the unhealthy period. At present, however, there is little evidence to infer how much, and through which prevention measures, lifestyle-related diseases can be decreased, and by how much this will extend healthy life expectancy. Further advances in research are needed.

Therefore, the goal was taken to be "to extend healthy life expectancy more than the increase of life expectancy." For healthy life expectancy, it is also important to try to extend the "period of time individuals consider themselves as healthy" together with the "period of time spent without limitation in daily activities." The period of time individuals consider themselves as healthy was compared between 2001 and 2010, and found to rise from 69.55 years to 69.90 years in men, an increase of only 0.35 years, and from 72.94 years to 73.32 years in women, an increase of only 0.37 years. Although these amounts of increase do not reach the targeted amount of exceeding the increase of life expectancy, they are noted because in the next 10 years it will be necessary to be mindful of trying to also achieve a certain level of extension in the period of time individuals consider themselves as healthy together with extension in the period of time spent without limitation in daily activities.
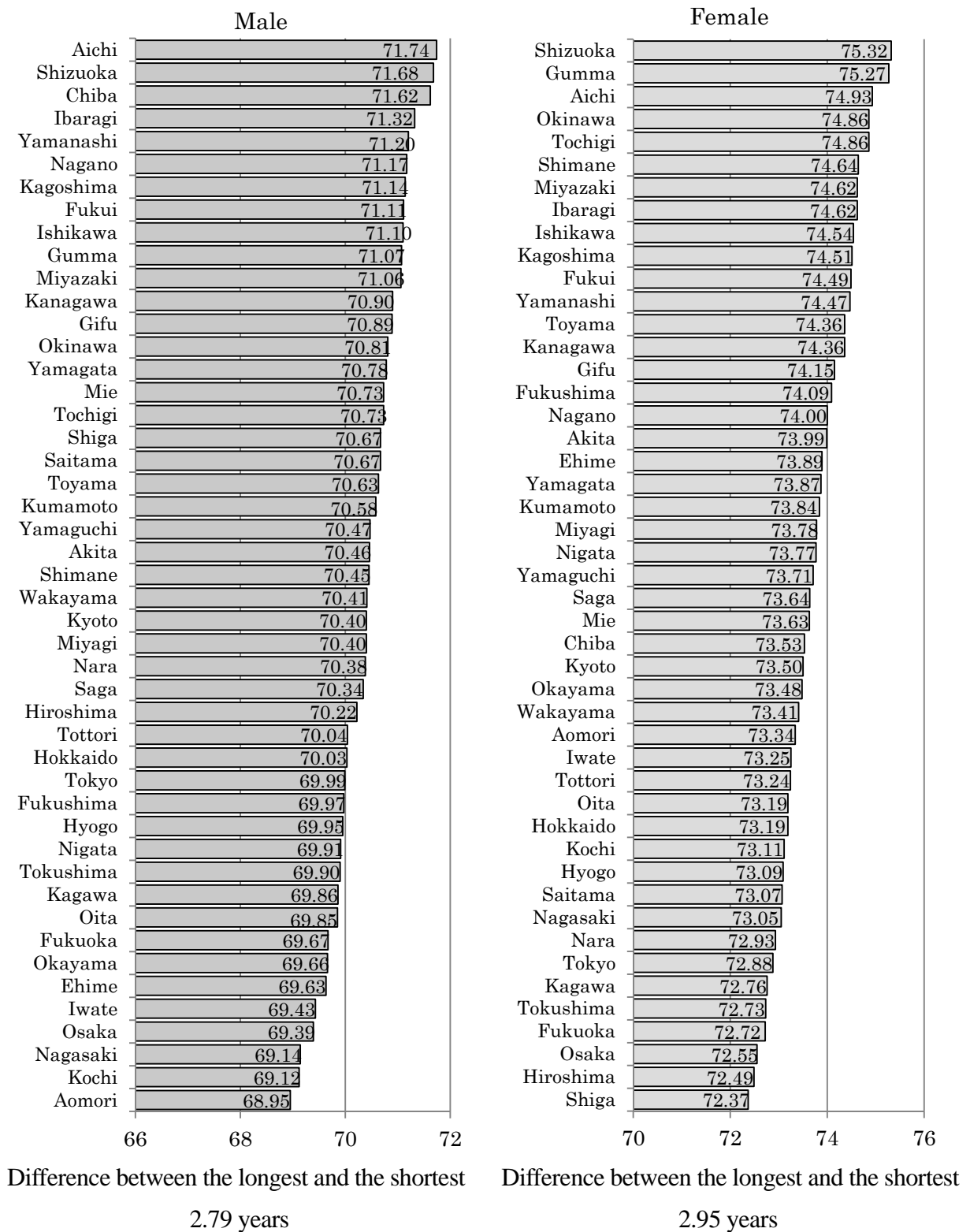
(ii) Reduction of health disparities

Target measure	Reduction in gap among prefectures in average period of time spent without limitation in daily activities
Current status	Men 2.79 years, women 2.95 years (2010)
Target	Reduction in gap among prefectures (2022)
Data source	Health and Labour Sciences Research Grants "Study on future predictions of healthy life expectancy and cost-effectiveness of measures to prevent lifestyle-related diseases" Note: Estimations based on Comprehensive Survey of Living Conditions

In 2010, the places where average period of time spent without limitation in daily activities were longest were Aichi Prefecture for men (71.74 years) and Shizuoka Prefecture for women (75.32 years). The shortest were Aomori Prefecture for men (68.95 years) and Shiga Prefecture for women (71.37 years). These are differences of 2.79 years for men and 2.95 years for women (Figure 4).

Reduction in gap among prefectures was established as a goal. In working to achieve this goal, however, we must assume that the figure for the prefecture with the longest healthy life expectancy is the goal each prefecture is working toward as it makes efforts to extend healthy life expectancy.

Figure 4. Average period of time spent without limitation in daily activities by prefecture (2010)

Male		Female	
Aichi	71.74	Shizuoka	75.32
Shizuoka	71.68	Gumma	75.27
Chiba	71.62	Aichi	74.93
Ibaragi	71.32	Okinawa	74.86
Yamanashi	71.20	Tochigi	74.86
Nagano	71.17	Shimane	74.64
Kagoshima	71.14	Miyazaki	74.62
Fukui	71.11	Ibaragi	74.62
Ishikawa	71.10	Ishikawa	74.54
Gumma	71.07	Kagoshima	74.51
Miyazaki	71.06	Fukui	74.49
Kanagawa	70.90	Yamanashi	74.47
Gifu	70.89	Toyama	74.36
Okinawa	70.81	Kanagawa	74.36
Yamagata	70.78	Gifu	74.15
Mie	70.73	Fukushima	74.09
Tochigi	70.73	Nagano	74.00
Shiga	70.67	Akita	73.99
Saitama	70.67	Ehime	73.89
Toyama	70.63	Yamagata	73.87
Kumamoto	70.58	Kumamoto	73.84
Yamaguchi	70.47	Miyagi	73.78
Akita	70.46	Nigata	73.77
Shimane	70.45	Yamaguchi	73.71
Wakayama	70.41	Saga	73.64
Kyoto	70.40	Mie	73.63
Miyagi	70.40	Chiba	73.53
Nara	70.38	Kyoto	73.50
Saga	70.34	Okayama	73.48
Hiroshima	70.22	Wakayama	73.41
Tottori	70.04	Aomori	73.34
Hokkaido	70.03	Iwate	73.25
Tokyo	69.99	Tottori	73.24
Fukushima	69.97	Oita	73.19
Hyogo	69.95	Hokkaido	73.19
Nigata	69.91	Kochi	73.11
Tokushima	69.90	Hyogo	73.09
Kagawa	69.86	Saitama	73.07
Oita	69.85	Nagasaki	73.05
Fukuoka	69.67	Nara	72.93
Okayama	69.66	Tokyo	72.88
Ehime	69.63	Kagawa	72.76
Iwate	69.43	Tokushima	72.73
Osaka	69.39	Fukuoka	72.72
Nagasaki	69.14	Osaka	72.55
Kochi	69.12	Hiroshima	72.49
Aomori	68.95	Shiga	72.37

Difference between the longest and the shortest
2.79 years

Difference between the longest and the shortest
2.95 years

<Method of calculating healthy life expectancy>
Method of calculating "average period of time spent without limitation in daily activities"

   "Average period of time spent without limitation in daily activities" is calculated using the Sullivan method (a method widely used to calculate healthy life expectancy), with information from Comprehensive Survey of Living Conditions and Life Table as basic data. Thus, a response of "No" to the question, "Do health problems currently have some effect on your daily activities?" in Comprehensive Survey of Living Conditions is taken to indicate limitation-free daily activities, and the percentages of people without limitation in daily activities were obtained for each sex and age group. Stationary population and number of survivors were obtained from Life Table. The percentage of people without limitation in daily activities was then multiplied by the stationary population for each sex and age group to obtain the stationary population without limitation in daily activities. Next, the totals for given age groups were divided by the number of survivors to obtain the "average period of time spent without limitation in daily activities."

   In prefectures, Comprehensive Survey of Living Conditions data, prefectural population, and number of deaths are used as basic data. The percentages of people without limitation in daily activities in each prefecture by sex and age group are obtained from the Comprehensive Survey of Living Conditions. Using the life table methodology of Chiang (a widely used method of calculating life tables), the stationary population and number of survivors in the prefecture are obtained. The average period of time spent without limitation in daily activities is obtained using a method similar to the above from the percentage of people without limitation in daily activities, stationary population, and number of survivors.

   In municipalities, when surveys are conducted in conformance with the Comprehensive Survey of Living Conditions, the basic data are taken to be the percentages of people without limitation in daily activities by sex and age group according to those surveys, the population of the municipality, and the number of deaths. The "average period of time spent without limitation in daily activities" can be obtained using the same method as for the prefectures. When a survey is not conducted and existing data are used, care information from long-term care insurance, the population, and the number of deaths in the municipality are used as basic data. "Average period of time spent independent in daily activities" (an index like "average period of time spent without limitation in daily activities") can then be obtained with a method similar to the above. In municipalities with small populations, the addition of a certain handling method needs to be considered in calculating the index (taking the number of deaths in multiple years, using 95% confidence intervals of the index, etc.). In municipalities with very small populations calculation of the index is difficult.

Note: Method of calculating "average period of time individuals consider themselves as healthy"

"Average period of time individuals consider themselves as healthy" is calculated using the Sullivan method with information from Comprehensive Survey of Living Conditions and Life Table as basic data. Responses of "Good," "Rather good," or "Ordinary" to the Comprehensive Survey of Living Conditions question of "How is your current state of health?" are taken to indicate that individuals consider themselves as healthy. Using the percentage of these responses, "average period of time individuals consider themselves as healthy" is obtained using the same method as for "average period of time spent without limitation in daily activities." In prefectures, "average period of time individuals consider themselves as healthy" is obtained with the same method as for "average period of time spent without limitation in daily activities."

In municipalities, similar to "average period of time spent without limitation in daily activities," it is possible to obtain the "average period of time individuals consider themselves as healthy" in cases when a survey is conducted by taking the percentage of individuals consider themselves as healthy by sex and age group from the survey, the municipal population, and the number of deaths as basic data. In municipalities with small populations, the addition of a certain handling method needs to be considered in calculating the index. In cases when a survey is not conducted, calculation of the index is difficult. This is because municipalities have no index similar to "average period of time individuals consider themselves as healthy" in municipalities in existing data. Calculation of the index is also difficult for municipalities with very small populations.

(Source: Health and Labour Sciences Research Grants "Study on future predictions of healthy life expectancy and cost-effectiveness of measures to prevent lifestyle-related diseases")

Results of the calculation in 2010

Prefecture	Average period of time spent without limatation in daily activities		Average period of time individuals consider themselves as healthy	
	Male	Female	Male	Female
Hokkaido	70.03	73.19	69.33	73.08
Aomori	68.95	73.34	68.89	73.46
Iwate	69.43	73.25	68.81	72.40
Miyagi	70.40	73.78	70.80	73.35
Akita	70.46	73.99	69.56	73.07
Yamagata	70.78	73.87	70.81	73.44
Fukushima	69.97	74.09	69.66	73.58
Ibaragi	71.32	74.62	71.09	73.99
Tochigi	70.73	74.86	69.94	74.33
Gumma	71.07	75.27	70.35	74.77
Saitama	70.67	73.07	70.62	72.98
Chiba	71.62	73.53	71.32	73.53
Tokyo	69.99	72.88	69.89	73.08
Kanagawa	70.90	74.36	70.85	74.12
Nigata	69.91	73.77	69.36	73.92
Toyama	70.63	74.36	69.42	73.72
Ishikawa	71.10	74.54	70.12	73.18
Fukui	71.11	74.49	70.23	74.34
Yamanashi	71.20	74.47	70.49	74.77
Nagano	71.17	74.00	70.76	73.56
Gifu	70.89	74.15	70.32	73.29
Shizuoka	71.68	75.32	71.01	74.86
Aichi	71.74	74.93	70.60	73.37
Mie	70.73	73.63	70.21	73.07
Shiga	70.67	72.37	70.10	73.03
Kyoto	70.40	73.50	69.56	73.31
Osaka	69.39	72.55	68.69	72.12
Hyogo	69.95	73.09	68.98	72.72
Nara	70.38	72.93	71.10	74.03
Wakayama	70.41	73.41	70.44	73.76
Tottori	70.04	73.24	69.67	72.67
Shimane	70.45	74.64	69.62	74.23
Okayama	69.66	73.48	69.20	73.73
Hiroshima	70.22	72.49	68.97	72.59
Yamaguchi	70.47	73.71	68.92	72.24
Tokushima	69.90	72.73	69.03	72.45
Kagawa	69.86	72.76	69.27	72.86
Ehime	69.63	73.89	68.70	73.45
Kochi	69.12	73.11	68.64	71.92
Fukuoka	69.67	72.72	68.89	72.14
Saga	70.34	73.64	69.80	73.28
Nagasaki	69.14	73.05	69.19	73.73
Kumamoto	70.58	73.84	69.66	73.76
Oita	69.85	73.19	69.13	72.85
Miyazaki	71.06	74.62	71.55	75.31
Kagoshima	71.14	74.51	70.77	74.70
Okinawa	70.81	74.86	70.46	73.84
All Japan	70.42	73.62	69.90	73.32

(Source: Health and Labour Sciences Research Grants "Study on future predictions of healthy life expectancy and cost-effectiveness of measures to prevent lifestyle-related diseases" http://toukei.umin.jp/kenkoujyumyou/)

iv Measures needed for the future

All of the activities presented in Health Japan 21 (the second term) are things that will contribute to extending healthy life expectancy. Monitoring the shifts in healthy life expectancy is therefore important in terms of managing the progress of this plan. Healthy life expectancy therefore should be calculated, and its trends investigated, each time a large-scale survey is conducted every three years in the Comprehensive Survey of Living Conditions.

While healthy life expectancy in each prefecture is calculated and announced, calculation of the healthy life expectancy in each municipality in the prefectures is desirable for the nation as a whole. Using each type of survey and statistic, it also would be desirable for prefectures to clarify the status of the health disparity in municipalities in their prefecture and make efforts to close those gaps. Doing this, however, requires a high level of statistical knowledge and skill in terms of the calculation procedures used in life tables and the handling of data in municipalities with small populations. Technical support for prefectures (training sessions, disclosure of calculation software, etc.) should be provided.

In approaching the issue of extending healthy life expectancy, the roles of promoting health and preventing disease are extremely important. Various other approaches are also needed, including early detection of disease, prevention of increasing disease severity with proper treatment management, prevention of the need for care, and provision of care services. Systems need to be developed for the seamless, integrated provision of these approaches matched to the health level and risks and health, welfare, and care needs of each person.

In the coming years the health disparity will also need to be monitored from perspectives other than healthy life expectancy. Aggregation of data from the various surveys carried out by the national government (Comprehensive Survey of Living Conditions, National Health and Nutrition Survey, Patient Survey, Survey of Long-term Care Benefit Expenditures) would help to enable comparisons of things such as lifestyle, health status, disease, and use of long-term care insurance in each prefecture, and is encouraged. It is also desirable that results of those comparisons be announced.

Translated by Toshiyuki Ojima and Shuji Hashimoto