

Nutrition Transition in Post-War Okinawa Exploring the Link Between Diet, Obesity and Longevity

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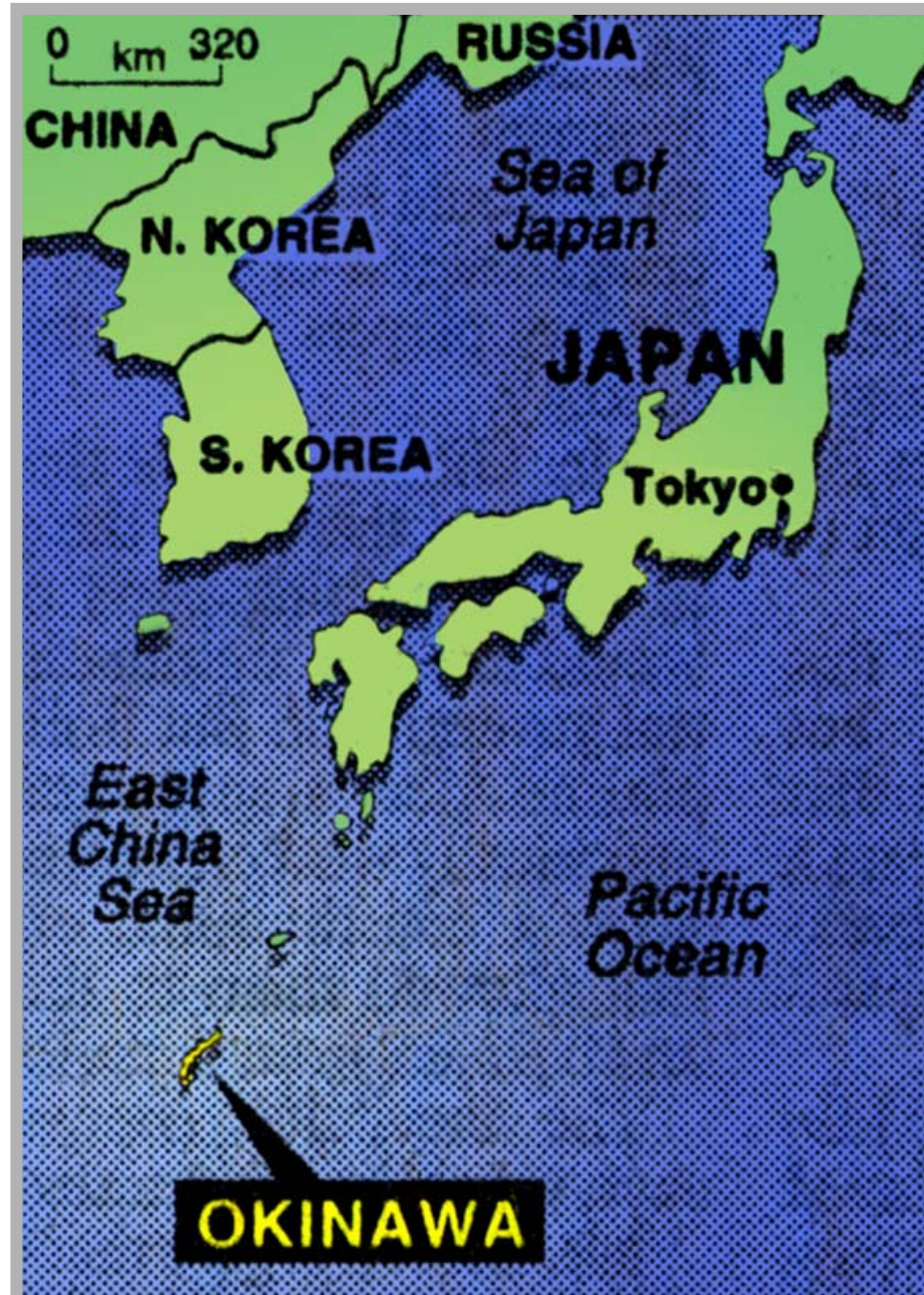
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Geographic Location of Okinawa



Low Mortality Rates in Several Long-Lived Areas vs the U.S.

Rank	Location	¹ LE	Mortality Rates (Age standardized)			
			² CHD	Cancer	Stroke	All Causes
1	Okinawa	81.2	18	91	35	335
2	Japan	79.9	22	106	45	364
3	Hong Kong	79.1	40	126	40	393
4	Sweden	79.0	102	108	38	435
8	Italy	78.3	55	135	49	459
10	Greece	78.1	55	109	70	449
18	United States	76.8	100	132	28	520

¹ Average life expectancy

² Coronary heart disease

World Health Organization 1996; Japan Ministry of Health 1996.

On U.S. Fast Food, Okinawans Are Super-Sized

By NORIMITSU ONISHI

URASOE CITY, Okinawa — Exhorting residents to slim down in the year ahead, the city government here has mapped out “The Great Citizens Campaign to Lose Three Kilograms.”

The plan is aimed directly at a social crisis that has spread across Urasoe and the rest of Okinawa, the subtropical Japanese islands that are usually busy wrestling with the tens of thousands of United States troops based here.

Longevity is still increasing. But

the bottom half of Japan’s 47 administrative regions. Okinawa’s women are still No. 1, but they too are almost certain to slip over the next decade, experts warn.

The fall has coincided, not surprisingly, with Okinawans’ emergence as Japan’s fattest people. Perhaps equally unsurprising is that waists have widened as Okinawans, ruled directly by the United States from the end of World War II to 1972, have, of all Japanese, most closely adopted the American lifestyle of cars, suburban malls and fast food.

In an unusual confluence of cuisine

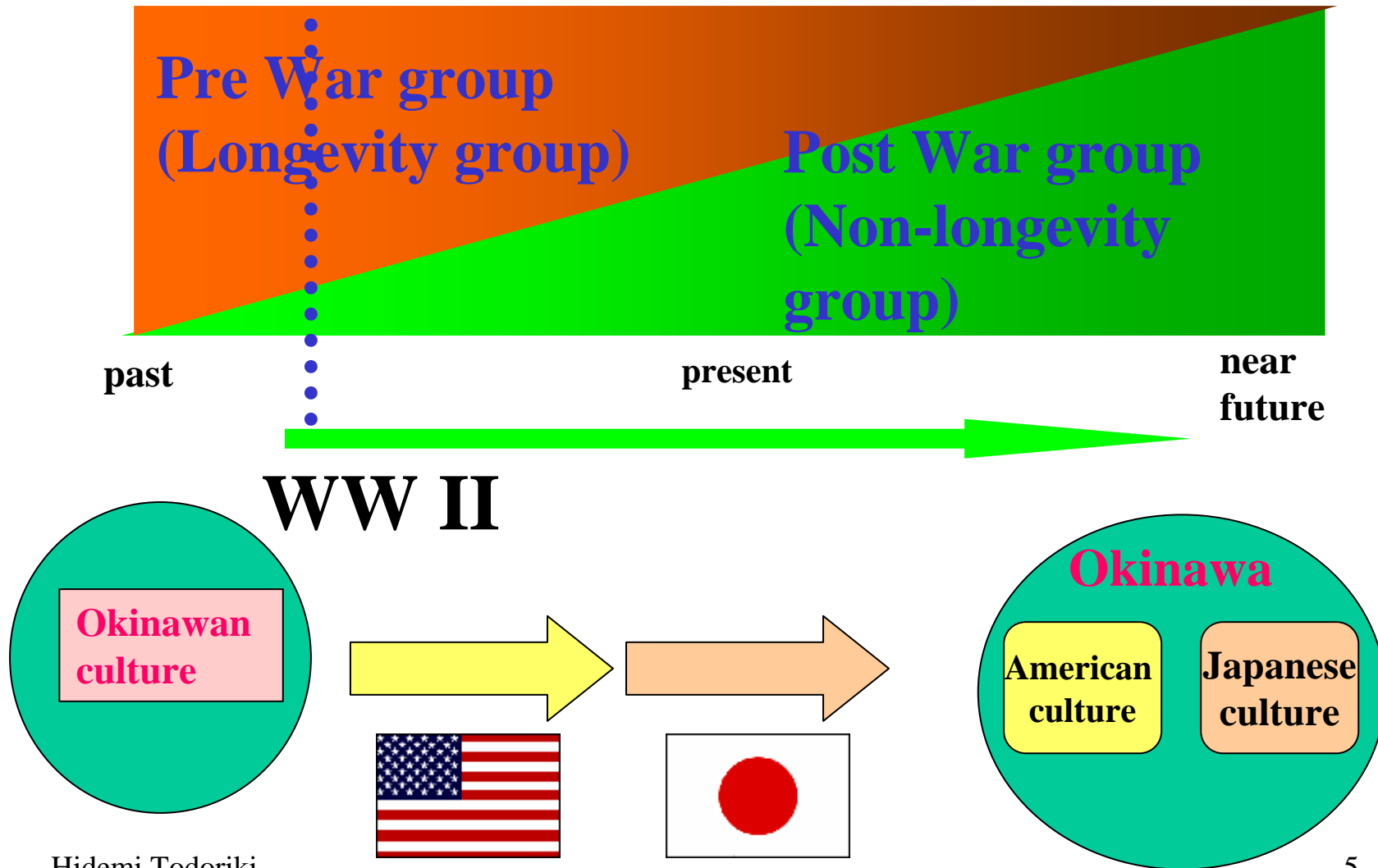
and culture, of America’s continuing might amid Japan’s postwar rebirth, Okinawans were caught in the middle, and the tug and pull can be seen in the differing dietary effects on the generations.

Older Okinawans clinging to the islands’ traditionally healthful diet still boast the longest life expectancy in Japan, the country with the world’s longest-living people. But younger islanders, who grew up coveting the America they peeked at inside the bases here, began gobbling up hamburgers, fried chicken and pizzas as soon as their incomes permitted them to do so.

“Okinawans’ emergence as Japan’s fattest people.”

The New York Times INTERNATIONAL
Tuesday, March 30, 2004

Okinawan Pre- and Post-War Group



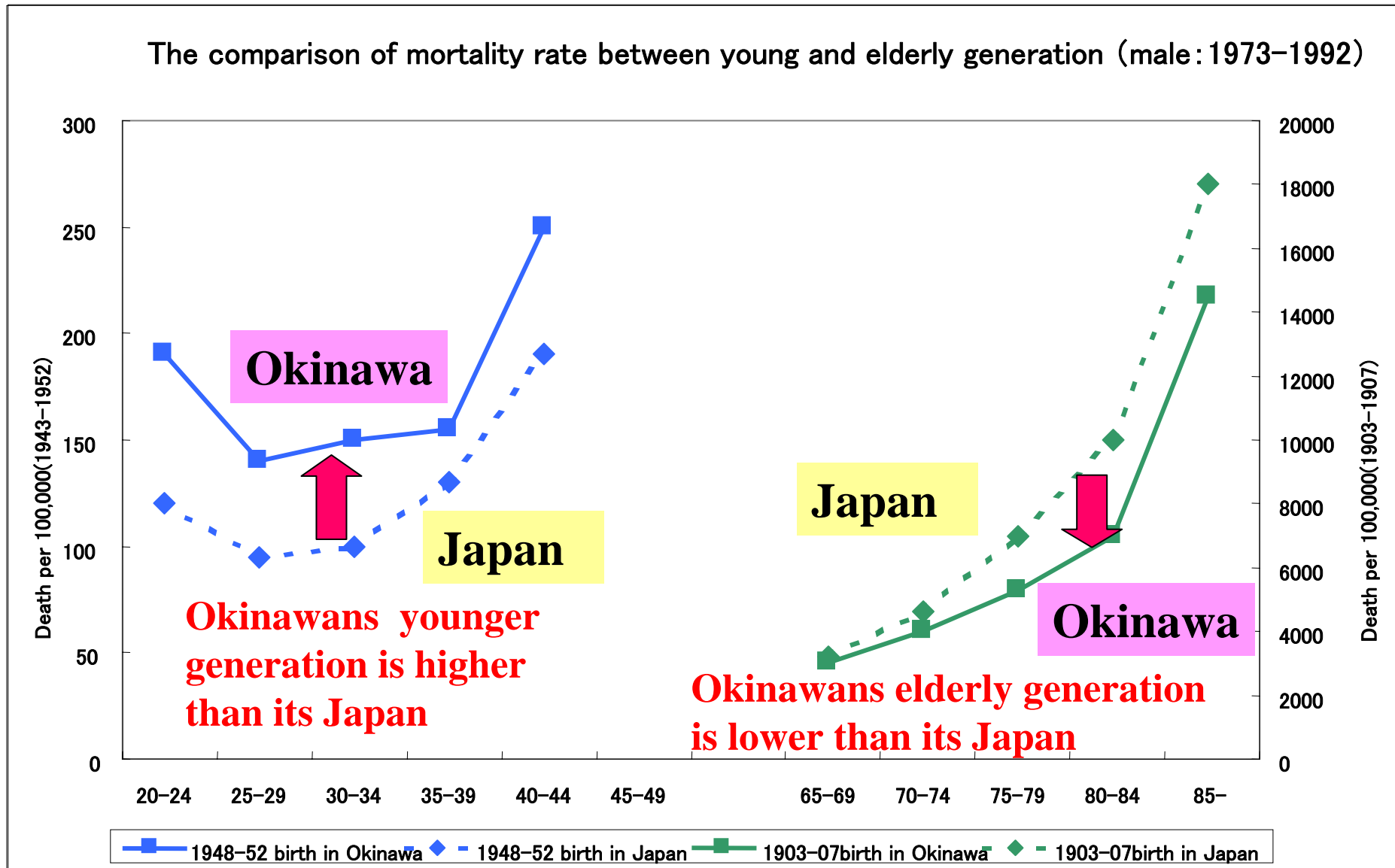
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Longevity of Okinawa

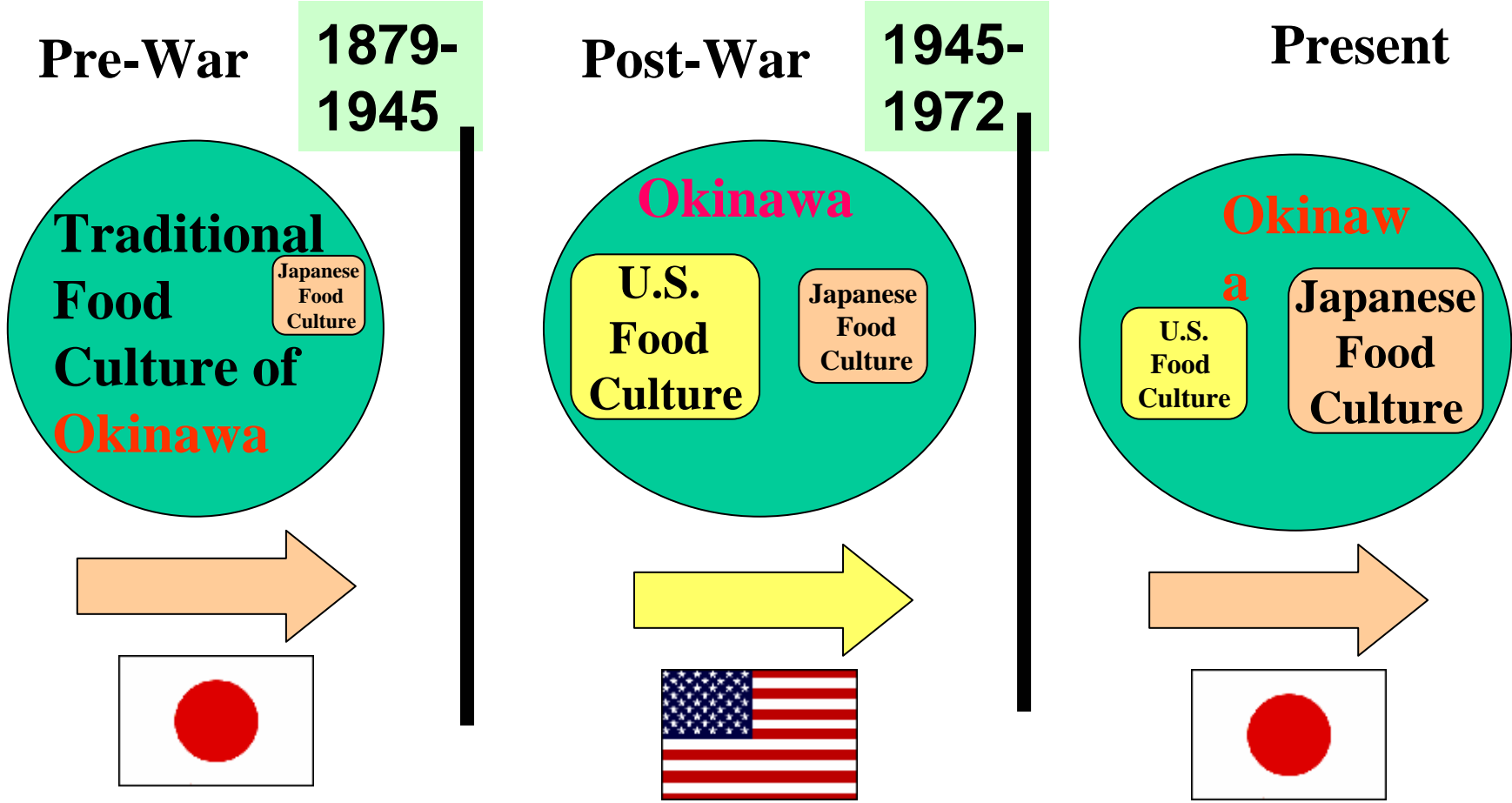
26 shock

- **Life expectancy ranking in Japan**
male: 4th place → 26th place
female: 1st place (20 years or more)
- **Prevalence rate of centenarians in Japan: 1st place (about twice as many as the 2nd place prefecture-Kochi)**

Okinawans elderly is supporting longevity.



Socio-cultural Influences on Traditional Okinawan Diet under the Three Different Administrations



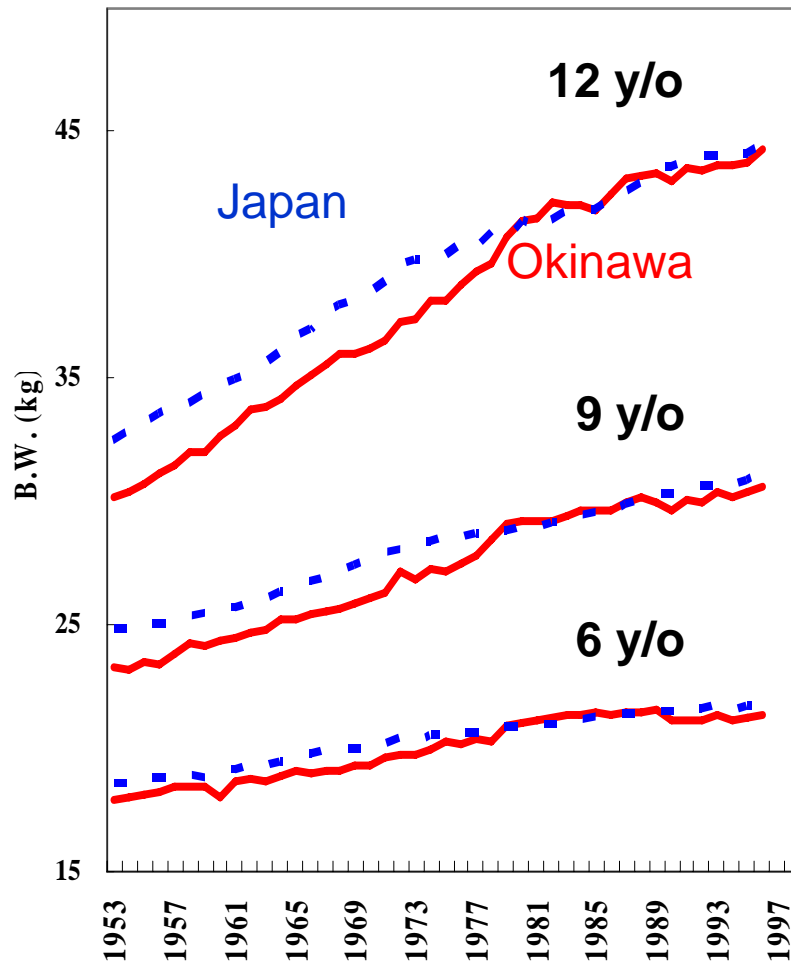
School Lunch in Okinawa around 1960: Bread and Milk, Western Style



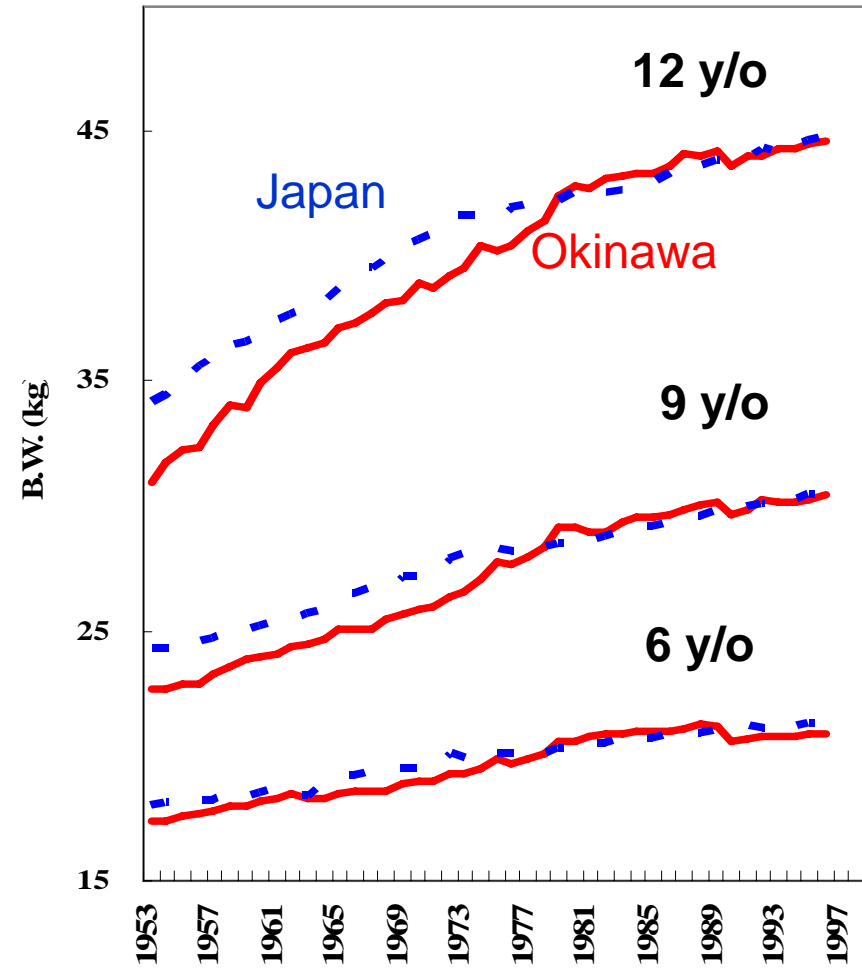
U. S. food reaches the customer

Yearly Trends of Body Weight

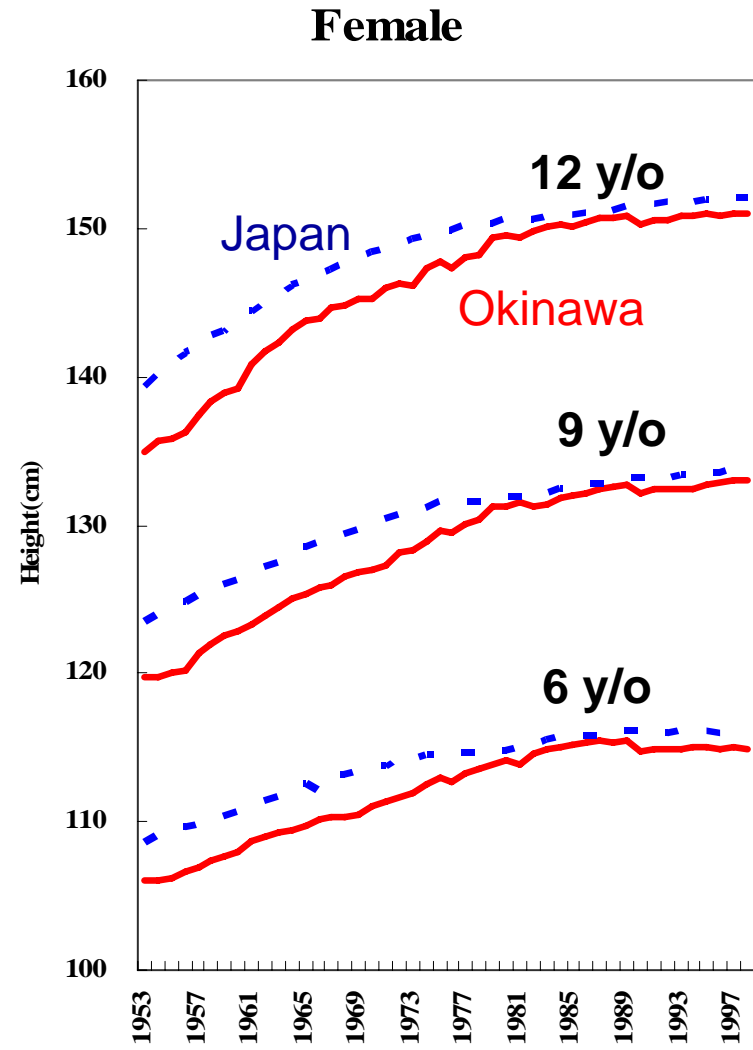
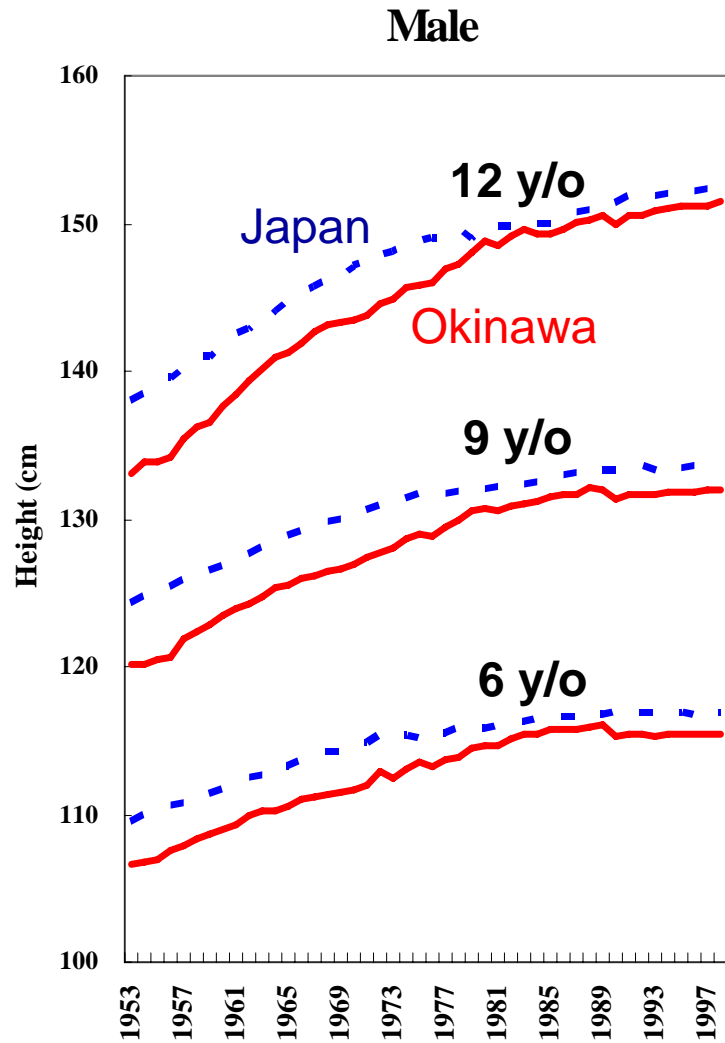
Male



Female



Yearly Trends of Height



Hokkaido+Tohoku

Cross cohort of difference of weight of school child (comparison with the whole country) according to the provinces(1946-1980)

Body weight difference happens drastically in Okinawa 1962-1974.

Overlapped with the 'Nutrition transition era'.

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Kanto

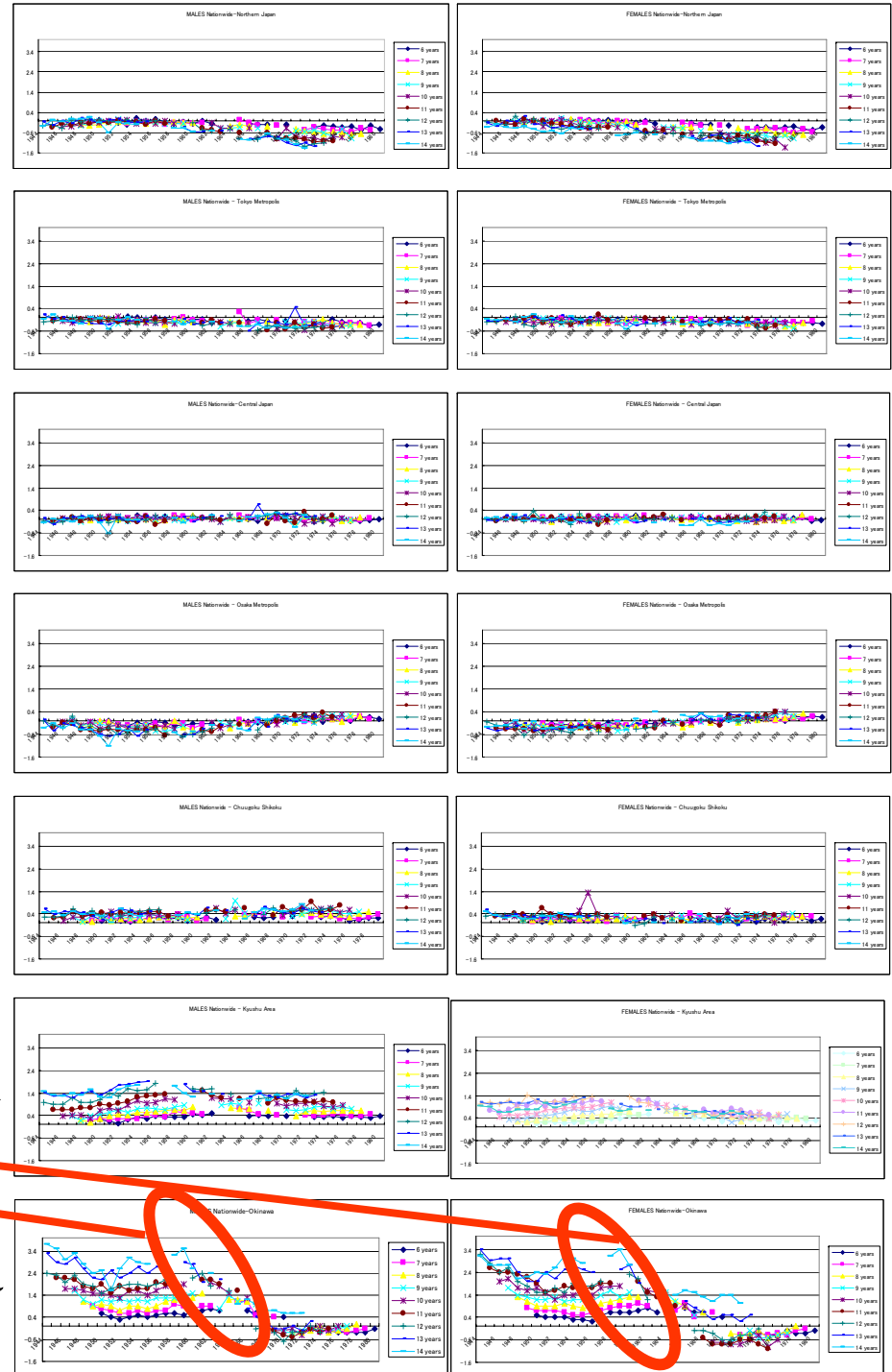
Chubu

Kansai

Chugoku
+Shikoku

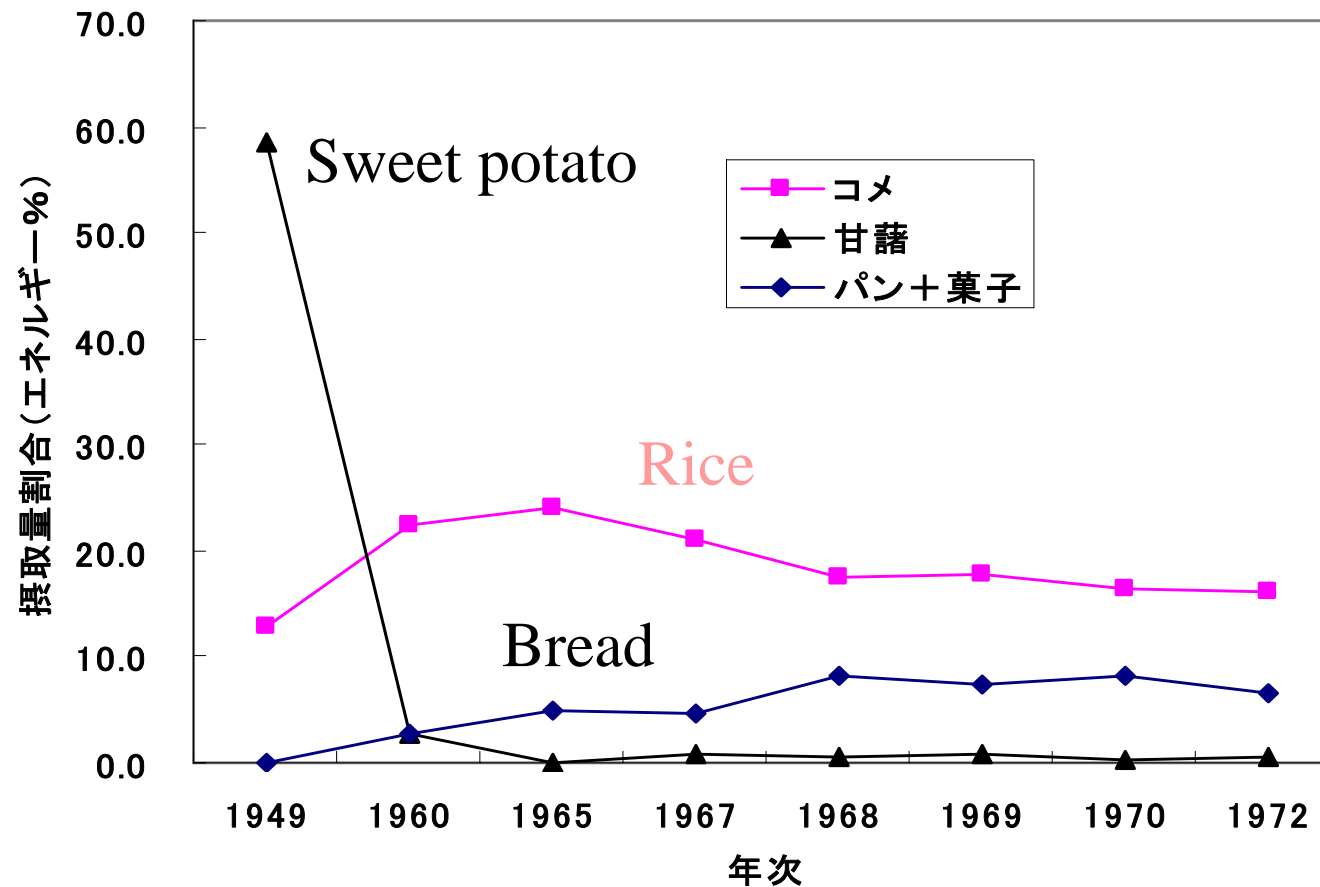
Kyusyu

Okinawa

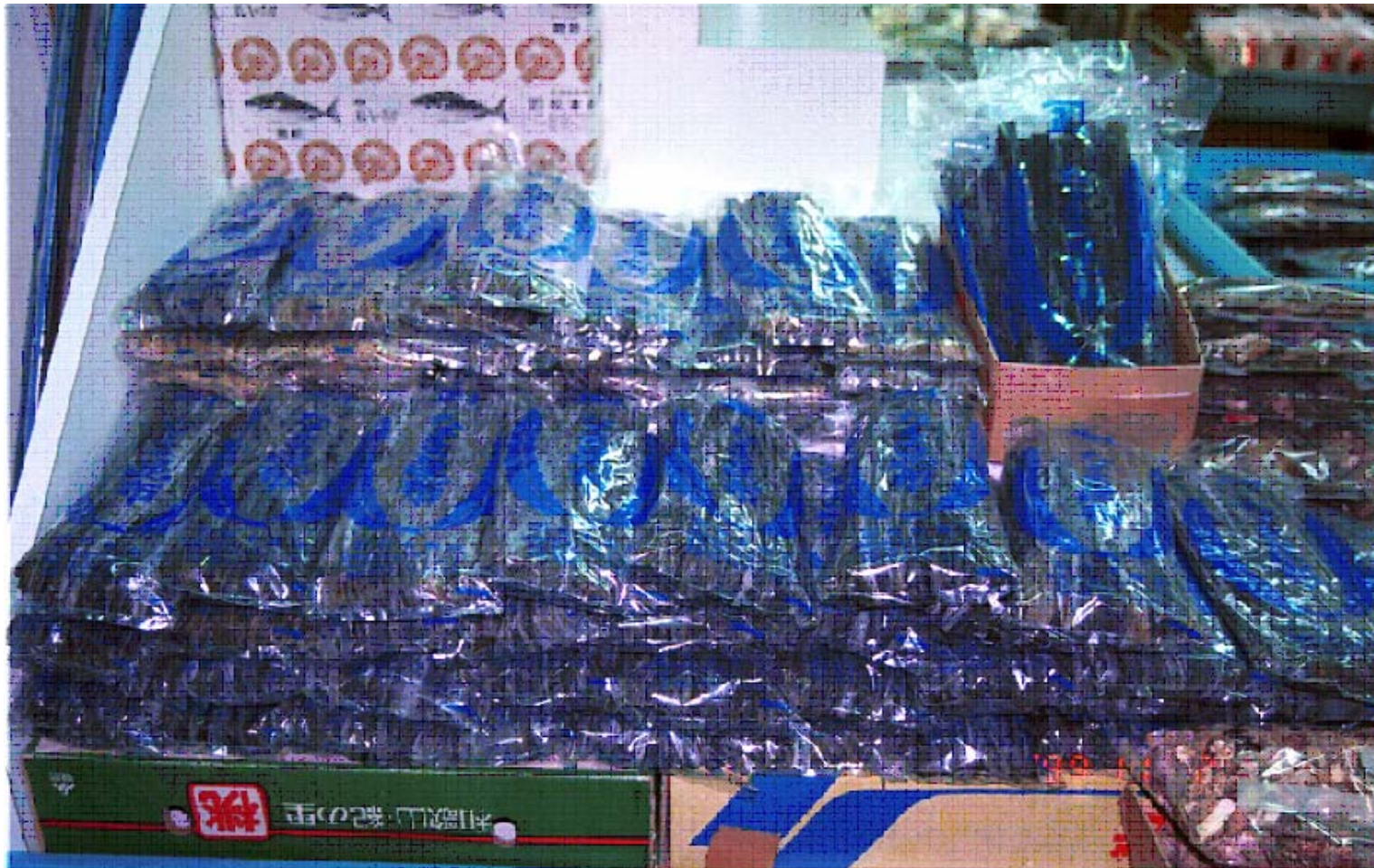


Yearly changes of energy density of staple foods (rice, sweet potato, and bread)

コメと甘藷の年次別摂取量推移(エネルギー密度換算)



Kelp (at a public market in Naha)



Yearly change of kelp consumption

表 家計調査年報による昆布の1世帯当たりの購入数量の年次別県庁所在地順位 単位:g

順位	昭和57年(1982)	昭和63年(1988)	平成5年(1993)	平成10年(1998)	平成11年(1999)
1	<u>那覇(1405)</u>	<u>那覇(1103)</u>	富山(1138)	富山(1044)	富山(1126)
2	富山(1281)	富山(1087)	盛岡(1053)	盛岡(1021)	青森(891)
3	盛岡(1023)	青森(918)	<u>那覇(969)</u>	山形(977)	山形(848)
4	青森(949)	山形(869)	山形(927)	青森(784)	盛岡(798)
5	長崎(908)	盛岡(864)	青森(904)	福島(752)	仙台(764)
6	山形(815)	仙台(821)	高知(817)	仙台(752)	宇都宮(706)
7	福岡(787)	松江(7749)	仙台(800)	<u>那覇(662)</u>	新潟(705)
19					<u>那覇(511)</u>
	全国(596)	全国(601)	全国(585)	全国(511)	全国(470)

出典：家計調査年報(総理府統計局)

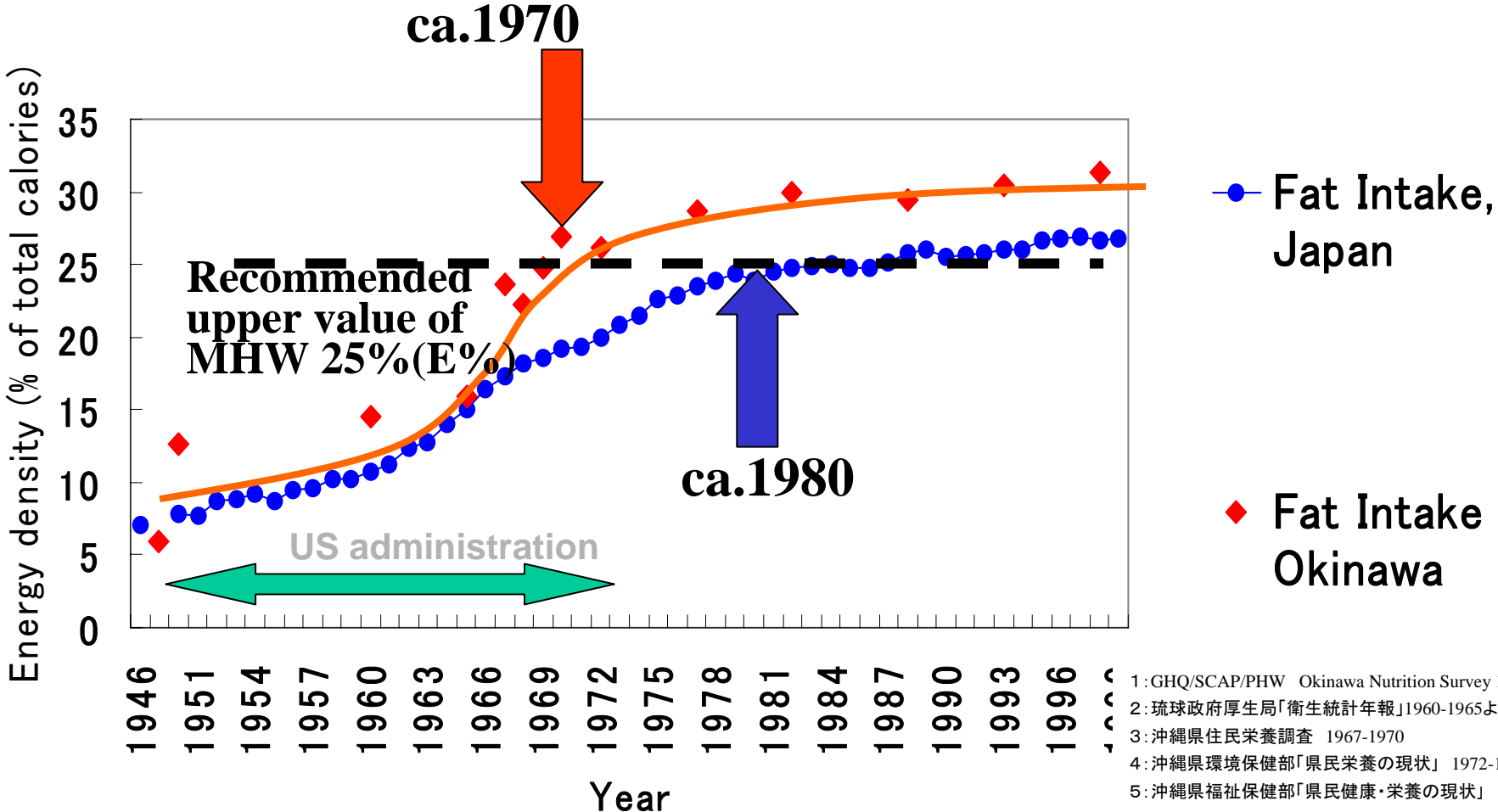
|括弧内の数字は1世帯当たりの購入数量

Okinawans' traditional food culture is changing.

Nutrition Transition

- **Starvation → satiation → optimum level**
- **Developing countries follow the same nutritional transition as developed countries.**
- **Putting conceptual model-making into empirical case study**
- **The change over the short term.**
- **The transition has been influenced by socioeconomic factors.**
- **The transition is a global phenomenon.**
- **The same concept: Demographic transition, epidemiologic transition, and health transition.**

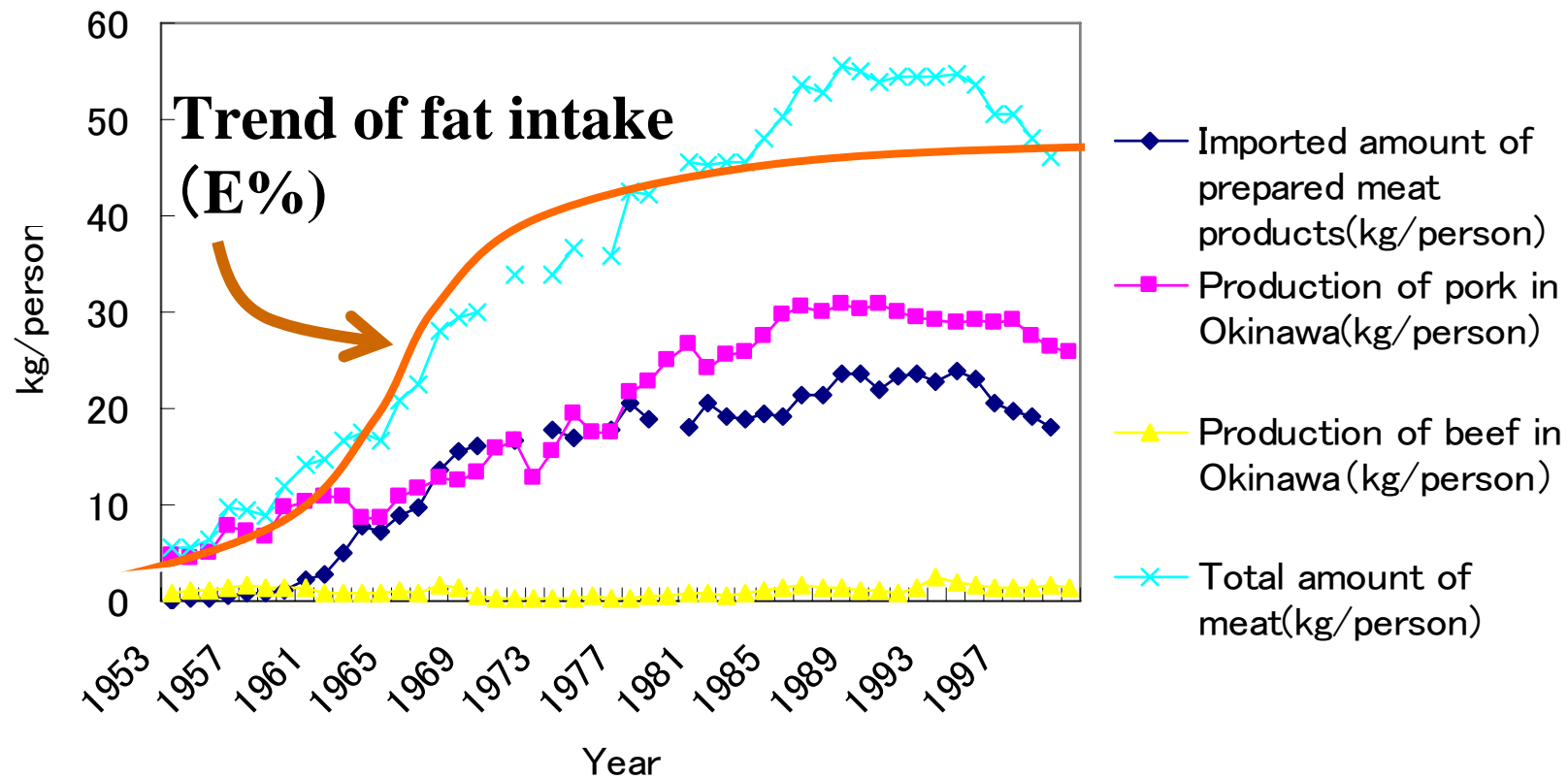
Nutrition Transition: Annual Change of Fat Intake in Okinawa and Japan



1: GHQ/SCAP/PHW Okinawa Nutrition Survey 1949.
 2: 琉球政府厚生局「衛生統計年報」1960-1965より作成
 3: 沖縄県住民栄養調査 1967-1970
 4: 沖縄県環境保健部「県民栄養の現状」1972-1993
 5: 沖縄県福祉保健部「県民健康・栄養の現状」1998

The increase in fat intake occurs earlier in Okinawa than in Japan.

Yearly trend of imported processed meat products (e.g. spam) and local production of meat in Okinawa



Canned Pork Luncheon Meat

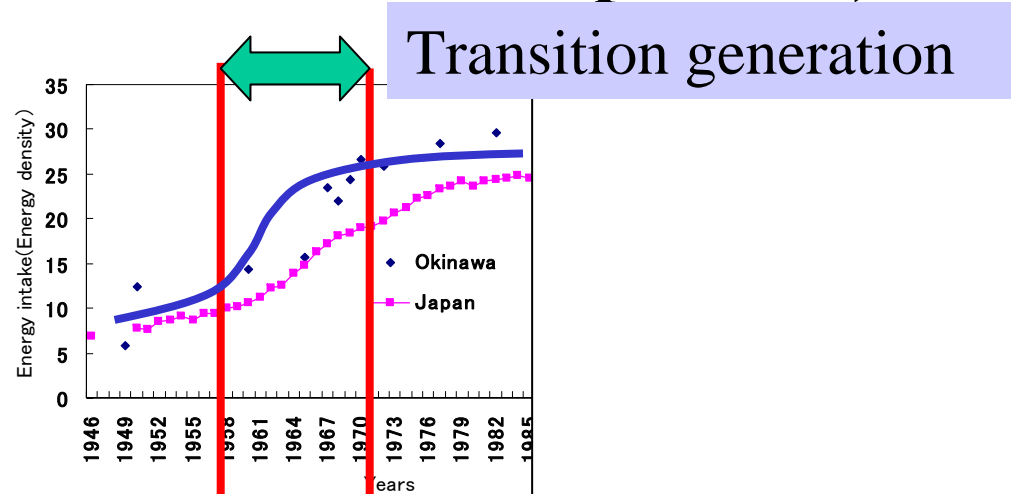
Import Amount: Okinawa as No.1 in Japan



Hid

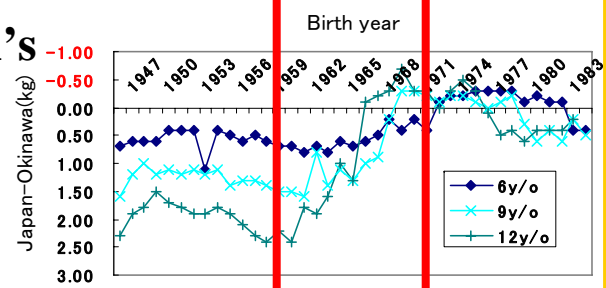
The relationship between nutrition transition (fat intake) and body weight of school children in postwar, Okinawa

Nutrition transition of fat intake between Okinawa and Japan



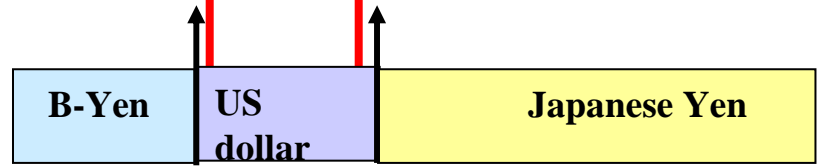
1972 Reversion to JPN

Annual transition of children's weight difference of birth cohort group in nationwide Okinawa



- 1954 Food assistance by the PL 480 Food for Peace Programs
- 1960 School Lunch Program (SLP) started
- 1960 Law of SLP
- 1962 Achieved the full implementation of SLP

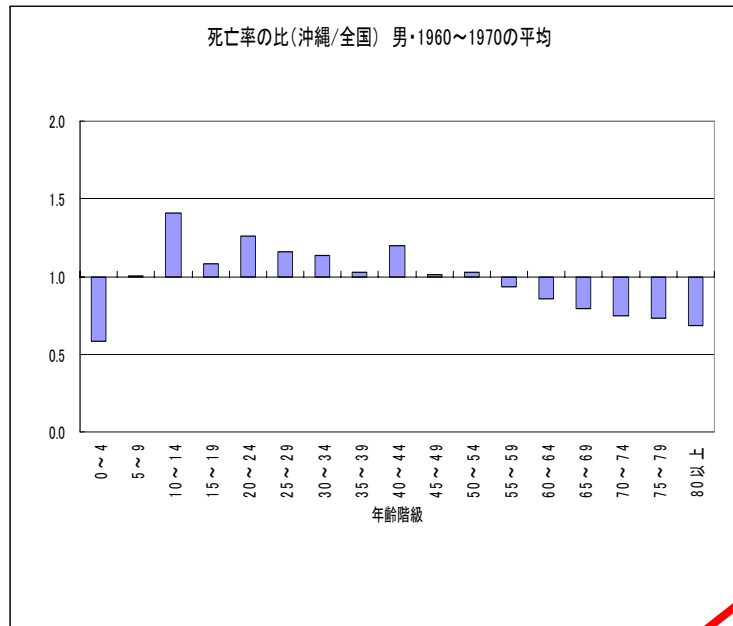
Monetary structure



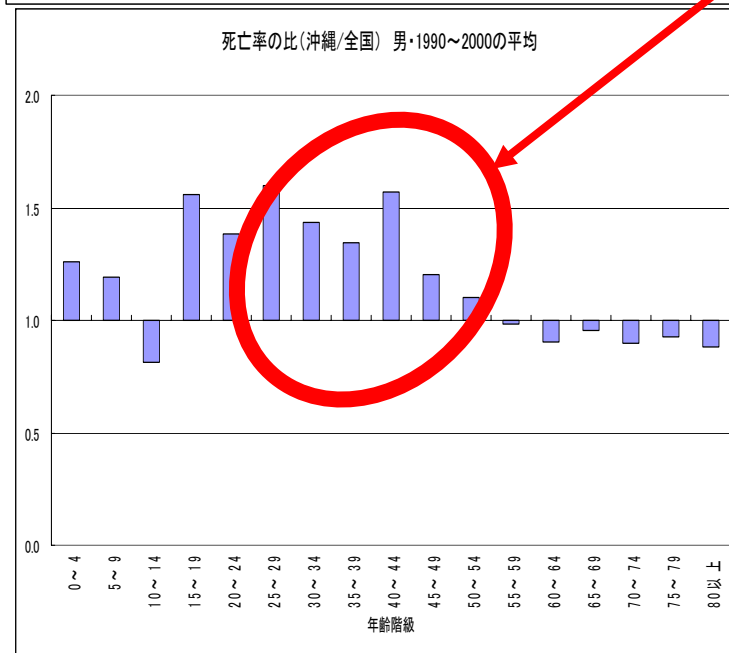
Age Adjusted Mortality Ratio

For Men in Okinawa vs. in Japan 1960-1970 (upper), 1990-2000 (lower)

1960-1970

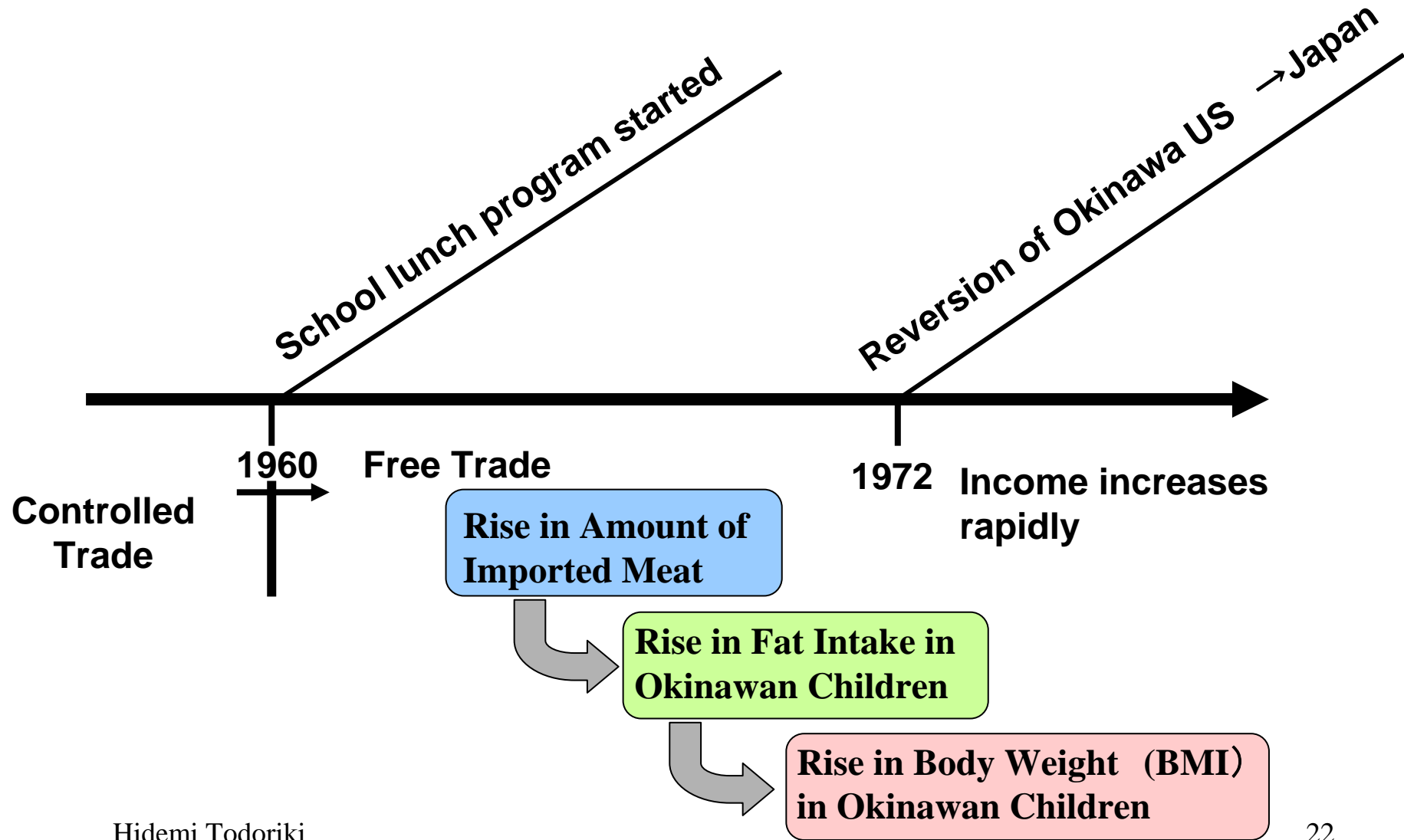


1990-2000



The younger Okinawan birth cohort groups (who were in the nutrition transition during their childhood) show an increase in its mortality and a decrease in its longevity vs. other Japanese.

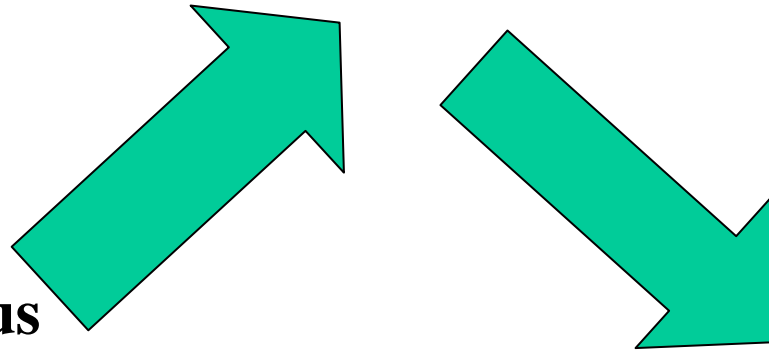
Model of Nutrition Transition and its Effects on Okinawan Children



Factors of Rise and Fall of the Ranking of Okinawan Life Expectancy

Factor of Rise

- Decrease of infant mortality
- Decrease of infectious disease), advantage from public health



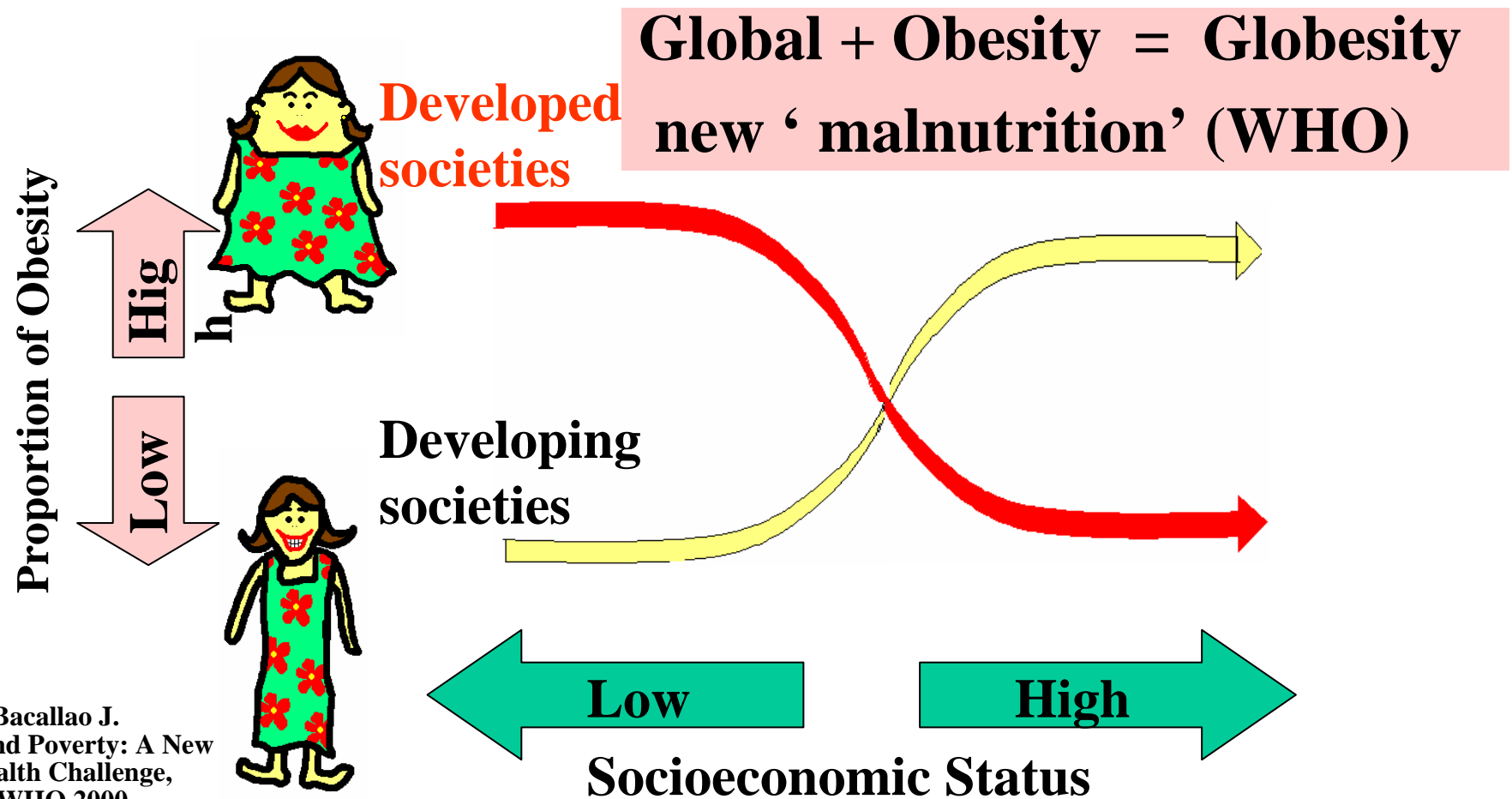
Factor of Fall

- Nutrition transition in post war
- Increase lifestyle-related disease (lung cancer, diabetes, stroke)

Important factor : 27 year U.S. Administration

Reversion to Japan

Relationship between obesity and socioeconomic status



Pena M., Bacallao J.
Obesity and Poverty: A New
Public Health Challenge,
PAHO & WHO 2000

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Conclusions

- 1) Descriptive statistical data indicate a correlation between children's body weight and body fat. These nutrition transitions occurred under the influence of socio-economic policy interventions of the US and later Japan.**
- 2) Such nutrition and body weight/BMI changes are likely to have long-term consequences for the future health and longevity of these cohorts, already evident in cohort mortality data.**

Okinawan Nutrition Transition

- 1) Cause and effect relationship of nutrition transition between political factors and economical ones**
- 2) Drastic increase in body weight of young generation may promotes the risk of life style related disease**
- 3) Birth cohort group (who were in the nutrition transition during their childhood) shows the increase in its mortality and the decrease in its longevity.**

**The birthday of an Okinawan Issei
(first generation immigrant in Canada).
On the left is his son in Okinawan's future?**



Hidemi Todoriki

Thank you very much