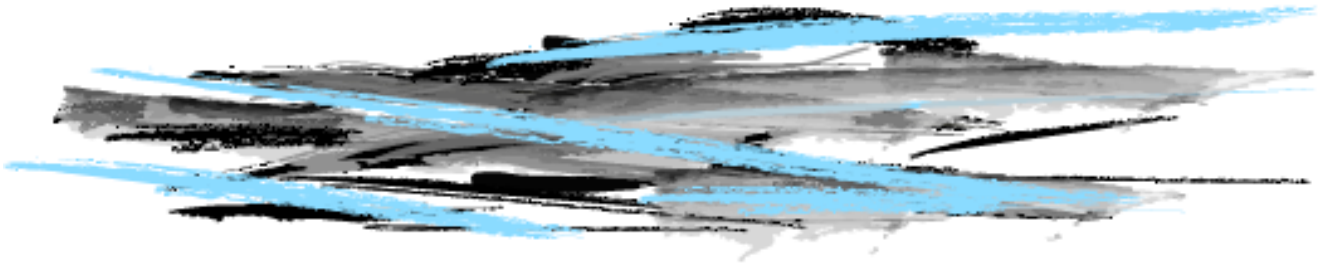
International Conference

The United States and the Pacific Islands
Culture, Science, Politics

November 25-26, 2006 New Hobun Bldg. University of the Ryukyus

Post-War American Influence on Public Health, Medicine and Health Trends in Okinawa



International Conference

The United States and the Pacific Islands
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November 25-26, 2006　New Hobun Bldg. University of the Ryukyus

Saturday, Nov. 25, 2006　Room 215

10:00-12:30 (Registration: 9:00 - 10:00)

Opening Session

Moderator: Tetsuo Heshiki (University of the Ryukyus, Japan)

Welcome Speech: Tatsuo Higa (Vice-President, University of the Ryukyus, Japan)

Katsunori Yamazato (Director, American Studies Center of the University of the Ryukyus, Japan)

Keynote Lecture

Gary Y. Okihiro (Columbia University, USA)

13:30-15:30

Session 1: The United States and Interacting Cultures in the Pacific

Moderator: Katsunori Yamazato (University of the Ryukyus, Japan)

Panelists: Darrell Y. Hamamoto (University of California, Davis, USA)

Isagani R. Cruz (Far Eastern University, Philippines)

Davianna McGregor (University of Hawai'i, USA)

Masahide Ishihara (University of the Ryukyus, Japan)

Discussant: Gary Y. Okihiro (Columbia University, USA)

Coffee Break: 15:30-16:00

16:00-17:00

Reading: Asian American Writers and the Pacific

Moderator: Ikue Kina (University of the Ryukyus, Japan)

Karen Tei Yamashita (University of California, Santa Cruz, USA)

18:00-20:00

Reception

Welcome Speech: Tatsuo Higa (Vice-President, University of the Ryukyus, Japan)

Sunday, Nov. 26, 2006　Room 114

10:00-12:00 (Registration: 9:00 - 10:00)

Special Lecture

Moderator: Takemitsu Arakaki (University of the Ryukyus, Japan)

Takayuki Tatsumi (Keio University, Japan)

13:00-15:00 **Room 112**

Session 2 (Round table): "Health in Danger?" : The US Impact on the Pacific Islands

Moderators/Discussants:

Hidemi Todoriki (University of the Ryukyus, Japan)

Craig Willcox (Okinawa Prefectural College of Nursing, Japan)

Discussants:

Seisho Higa (Okinawa Prefecture, Okinawa)

Tomohiro Hirao (Kagawa University, Japan)

Masao Maeshiro (Okinawa Chubu Hospital, Japan)

Seizo Sakihara (Okinawa International University, Japan)

Makoto Suzuki (Okinawa Research Center for Longevity Science, Japan)

Bradley J. Willcox (University of Hawai'i, PHRI, USA)

Coffee Break: 15:00- 16:00

16:00-18:00

Session 3: The United States and the Pacific Islands: Strategy and Domestic Politics

Moderator: Masaaki Gabe (University of the Ryukyus, Japan)

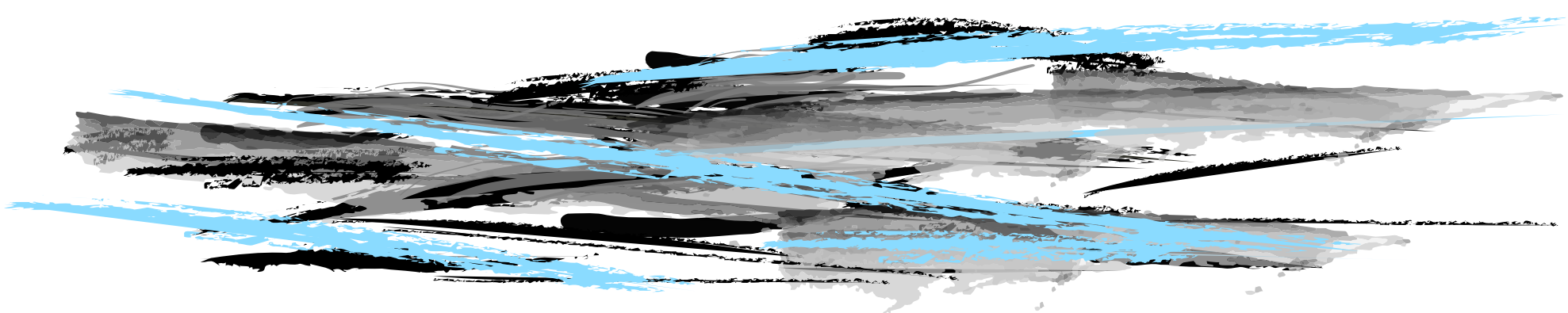
Panelists: Vernadette Gonzales (University of Hawai'i, USA)

Mark Selden (Cornell University, USA)

Discussant: Ronni Alexander (Kobe University, Japan)

Hosts/Organizers: American Studies Center of the University of the Ryukyus
American Studies Society of the University of the Ryukyus

Sponsors: Japan-United States Friendship Commission
University of the Ryukyus



Post-War American Influence on Public Health, Medicine and Health Trends in Okinawa

Part 1 Title: Post-War American Influence on Population Health in Okinawa: The Early Years 1945-1972

1. **Influence of US Occupation of the Ryukyu Islands for 27 Years From 1945 to 1972 on Health Problem in Okinawa.**

Seizo Sakihara, Ph.D.
Professor Emeritus University of the Ryukyus
Professor of Okinawa International University, Okinawa, Japan

2. **The effects to people's health of the establishment of public health centers in Okinawa after the World War the Second**

Seisho Higa, M.D., M.P.H.
Director of Okinawa North Public Health & Welfare Office, Okinawa, Japan

3.**Contribution of U.S. Administration on the training of physicians and nurses in Okinawa**

Masao Maeshiro, M.D., FACS
University of Hawaii, Okinawa Chubu Hospital, Okinawa, Japan

4. **The U.S. occupation and its influence to Okinawan longevity --Transition of Okinawan longevity under the U.S. governing--**

Makoto Suzuki, M.D., Ph.D.
Professor Emeritus University of the Ryukyus
Okinawa Research Center of Longevity Science, Okinawa, Japan

Part 2 Title: Health in Danger? Recent Health Transitions in Okinawa 1972-Present

5. **Caloric Restriction, Energy Balance and Healthy Aging: Evidence for an Impact on Preand Post-War Generations of Okinawans in Okinawa and Hawaii**

Bradley Willcox, M.D.
Pacific Health Research Institute, Department of Geriatric Medicine and Medicine, John A. Burns School of Medicine,University of Hawaii, Honolulu, Hawaii

6. **Longevity in Peril: An Exploration of Mortality Changes in Okinawa 1985-2000**

Craig Willcox, Ph.D.
Okinawa Prefectural College of Nursing, Okinawa, Japan

7. **The Nutrition Transition in Postwar Okinawa: The Relationship between Dietary Changes and Body Weight**

Hidemi Todoriki, Ph.D.
Department of Environmental and Preventive Medicine, Faculty of Medicine, University of the Ryukyus, Okinawa, Japan

8. **Recent Trends in Health Status of Okinawa: Comparison with whole nation**

Tomohiro Hirao, M.D. Ph.D.
Health Policy and Management, Kagawa University, Japan

Influence of US Occupation of the Ryukyu Islands for 27 Years from 1945 to 1972 on Health Problems in Okinawa

Seizo Sakihara, PhD
Okinawa International University

Background: After World War II, the United States had occupied Japan and "the Ryukyu Islands" for seven years and 27 years respectively. This different period of occupation had brought about different effects on social and everyday life of Japanese and Okinawans. In addition, the US Military Government in the Ryukyu Islands had kept all powers in political, economic, and social activities of civilians. GHQ in Tokyo, however, had indirectly controlled over Japan. Although US Occupation in Japan was terminated according to the Peace Treaty with the Allied Powers and the US-Japan Security Treaty in 1952, the Ryukyu Islands had been under the US administration without a break. The US policy toward the Ryukyu Islands after conclusion of the peace treaty with the Allied Powers in 1951 was as follows: 1) Maintenance of permanent military installation, 2) Support Okinawans to meet humanitarian minimum needs, and 3) Improvement of the standard of living of Okinawans to that in prewar level.

Health and Medical Services: At first stage of Military Government, all health and medical manpower was under the US Military Government management, and also medical care services were provided by the US Military Government with assistance of local medical personnel. They had carried out intensive mosquito-borne disease control program with DDT spraying to all shelters in Okinawa island both military barracks and native houses. They also paid much attention to control sexually transmitted disease (STD) and therefore public health centers were founded where the STD cases were detected and treated. In general, the first priority was given to protection of US military personnel. In December 1950, the US Military Government Organization in the Ryukyu Islands had shifted to the United States Civil Administration of the Ryukyu Islands (USCAR) headed by a Military Officer as the High Commissioner. This political change had emerged according to the SCAP Directives of the GHQ to accomplish the Military purposes. Accordingly, various provisional civilian administrative organizations and services had changed to permanent systems for civilian populations to maintain stable US Military functions in the Islands.

Influences of the US Administration in the Ryukyu Islands on health problems: A long period of US Occupation in the Ryukyu Islands caused positive effects and also adverse effects on health and lifestyle of Okinawans today as described.

I. **Positive Effects**:

1. Provided survived civilians with food by ration during and immediately after the hostilities in the southern area of Okinawa Island.
2. Improvement of environmental sanitation with Island-wide piped water supply and intensive mosquito-borne disease control program.
3. Development of community-based public health nursing program.
4. Improvement of tuberculosis control program.
5. Development of health manpower by scholarships to study in the United States and Mainland Japan.
6. Improvement of training programs for medical doctors including postgraduate training at the Chubu Hospital

II. **Adverse Effects:**

1. Hastening westernized food habits such as high consumption of fast-food and fat-rich animal meet.
2. Motorized society contributed to the highest rate of obesity in the country.
3. Lack of active leadership of Shi-Cho-Son's mayors in community health planning due to that responsibility had been carried out by the Central Government through Public Health Centers under the US Administration.
4. No universal health insurance program existed until 1972.
5. Continued aircraft noise pollution around US military bases.
6. The migration program planned by the USCAR triggered off the outbreak of the second epidemic of malaria in postwar Yaeyama Islands from 1952 to 1958.

Influence of US Occupation of the Ryukyu Islands for 27 Years from 1945 to 1972 on Health Problems in Okinawa

Seizo Sakihara, Ph.D
Okinawa International University

Collection Centers for Civilians Survived

- Ryukyuan Civilians were under US Military Government control and were held in collection centers in 1945 and 1946.
- They were provided with camp and ration, but without water supply, electricity and sanitary toilet.

Military Government Proclamation No.9 "Public Health and Sanitation" (1945)

Physicians, dentists, pharmacists, nurses, midwives and others engaged in treatment of the sick, treatment in prevention of disease, or the dispensing of drugs who have been licensed to perform such service in the occupied territory will continue in their respective professions until further orders are issued by my Military Government.

Naha City was destroyed by fierce US bombing on October 1944

On 1 April 1945, US troops ashore west coast of Okinawa Island

US Military Government in the Ryukyu Islands
(1945 ~ 1972)

April 1945－ June 1946
US Naval Military Government

July 1946－ December 1950
US Army Military Government

December 1950－May 1972
United States Civil Administration of the Ryukyu Islands (USCAR)

US Military Government's Policy in Public Health (1945 ~ 1950)

1. Made much of sanitation to control infectious diseases, such as malaria, Japanese B encephalitis, and venereal disease.
2. Set up nine Public Health Districts in Okinawa Island to operate effective DDT spraying.
3. Development of intensive mosquito and fly control program with DDT spraying.

US Military Government Ryukyu Islands Directive No. 33, "Sanitation Regulation" (15 September 1948)

Article 5 Sanitation Procedure

5 Livestock

a. Farm animals (goats, horses, cows, pigs and donkeys) shall not be permitted in or around living quarters in villages.

Infectious Diseases in Okinawa Gunto

Year	1946	1947	1948	1949	1950
Japanese Encephalitis	29	196	60	51	2
Diphtheria	66	213	167	97	129
Amebiasis	1,785	1,865	274	77	69
Pulmonary TB	4,499	4,726	2,414	1,749	2,254
Trachoma	48,737	64,080	18,748	6,866	5,859
Malaria	160,098	120,560	31,866	6,456	1,202
Filariasis	463	378	355	298	424

Source: Department of Health, Okinawa Gunto Government, 1950

Nutrition Survey in Okinawa Gunto, 1949

(Grams and Calories per Capita per Day)

	Total	Urban	Rural
Grains	192.3	336.4	167.8
Potatoes	851.6	310.8	943.1
Sugar	3.0	6.5	2.4
Fat and Oil	3.4	3.9	3.3
Legumes	71.3	93.6	67.6
Fish	14.9	32.1	12.0
Meat & Poultry	3.2	11.0	1.9
Eggs	1.4	3.4	1.1
Milk	0.2	1.3	0.0
Green Vegetables	73.5	75.6	73.1
Other fruits & Vegetables	40.7	59.1	37.6
Seaweeds	0.7	1.8	0.5
Protein	38.8	55.1	36.0
- animal	4.4	10.8	3.3
- vegetable	34.4	44.3	32.7
Calories	1,784.9	1,821.4	1,778.7

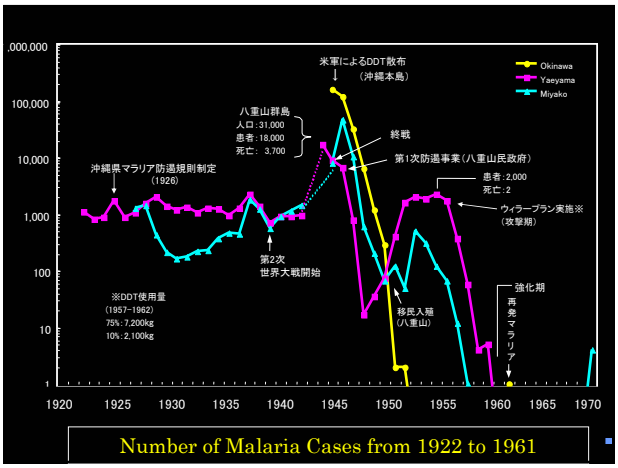
大磯敏雄：『栄養調査』の功績、尚弘子・山本茂編『沖縄の長寿』1-30頁 学会センター関西（大阪）、1999

Health Policy of the USCAR (1951 ~ 1972)

- Infectious disease control: TB and parasitic
- Establishment of public health centers
  VD and food sanitation
- Public health nursing program: TB, leprosy
- Training of health manpower
  WHO, EWC, ARIA, Government of Japan
- Sanitation
  Piped-water supply and sewage disposal

Food Sanitation Under US Administration

Sgt McCoy inspects water at a "A sign" restaurant approved for US military personnel use (1956).



Number of Malaria Cases from 1922 to 1961

Scholarship Programs for Future Leaders in the Ryukyu Islands (1950 ~ 1971)

- 1951, first GARIOA scholarship grantees of 54 Ryukyuan students departed for US colleges and universities.
- RYCOM/ARIA scholarship
- East-West Center's scholarship (Hawaii)
- Government of Japan's Scholarship
  - *Keiyaku* students
  - *Kouhi* students
  - *Kokuhi* students

On the Job Training Programs for Health and Medical Manpower (1960 ~ 1971)

- East-West Center's grants
  - Hawaii and Ryukyu Islands
- World Health Organization's Fellowship
  - UK, Denmark, Philippines, India, New Zealand, and Japan
- Army Ryukyu Islands Aid (ARIA)
  - Taiwan

Positive Effects of the US Occupation in the Ryukyu Islands

- Drastic development of sanitation by US Military Government of unlimited power
- Intensive measures to control mosquito-borne diseases
- Improvement of Public Health Services through Public Health Centers and community-based public health nursing program
- Improvement of TB control program
- Professional and technical assistance from WHO and Government of Japan
- Development of the On the Job training programs for health manpower

Negative Effects of the US Occupation in the Ryukyu Islands

- Acceleration of westernized food habits of Okinawan people, especially in younger generations
- Motorized society contributed to the highest rate of obesity in Japan
- Passive attitude of Mayors of municipalities toward community health planning
- No universal health insurance program existed until 1972
- Continued aircraft noise pollution around US military bases.
- Migration program of the USCAR triggered off the outbreak of malaria in Yaeyama islands from 1952 to 1958

The effects to people's health of the establishment of public health centers in Okinawa after the World War the Second

Seisho Higa, M.D., M.P.H.
Director of Okinawa North Public Health & Welfare Office

1 The establishment of health centers in Okinawa 1951

1-1 **The stationing Public Health Nurses activities** in municipal areas supported by their health center stuffs such as physicians, dentist, dietician, laboratory technicians, radiologists, etc. devoted the improvement of health of community people.

1-1-1 The immunizations

1-1-1-1 Small pox vaccine in 1952

1-1-1-2 Single vaccine for diphtheria and pertusis in 1953

1-1-1-3 DPT triple combined vaccine in 1957

1-1-1-4 Japanese encephalitis vaccine and Salk's vaccine for poliomyelitis in 1961 and polio live vaccine in 1963

1-1-2 The health guidance, consultation, clinic and others for infant care

1-1-2-1 Health guidance by home visits

1-1-2-2 Health clinic for infant

1-1-2-3 Health consultation and guidance for infants by PHN

1-1-2-4 Health activities after promulgation of The Child Welfare Law in 1953

1-1-3 The treatment of venereal diseases

Notification from designated hospitals in Okinawa indicated 5,536 venereal diseases in 1953,4,368 of which were gonorrhea,912 syphilis.

After setting up of public health center, serum test for syphilis, gonorrhea staining test and treatment with follow up on infectious sources was conducted in the center.

Further, the U.S. military government created the "A-sign system". To receive a license for food handling business, the businessman had to receive certification of free of venereal disease after checking of STS and smear test for gonorrhea of his workers from the public health center.

The Venereal Prevention Law legislated by the Ryukyu Government in 1962, made possible free examinations and treatment at public health centers for the general public. As a result, those women working in entertainment areas without A-sign accreditation also started to receive examinations and

treatment at public health centers.

1-1-4 The treatment and administration of tuberculosis cases

In 1951,a study conducted in order to measure the tuberculosis prevalence rate in Okinawa by follow up 10,000 residents revealed the estimated number 0f patients requiring treatment were 1% of the population that indicated 7,000 cases.

At the time, sanatoriums in Okinawa had 240 beds. One program to overcome this was to designate public health centers as treatment institutions and to use public health nurses to conduct treatment the cases at home. Tuberculosis sanatoriums also increased their bed turnover rate by examining inmates and limiting stay for around 6 months. Public health nurses stationed in municipal areas visited tuberculosis cases who were discharged from sanatoriums, newly diagnosed and receiving treatment at home. Some patients with sputum smear positive were referred to sanatorium around mainlandJapan.During1962 to 1983 , approximately 2,800 cases were sent outside the prefecture.

By all the efforts, including hard work of public health nurses in Okinawa, help of medical specialists from sanatoriums in Japan, assistance from the research center of tuberculosis of Japan anti-tuberculosis association, etc, the tuberculosis incidence rate and prevalence rate of Okinawa today became almost average level of Japan.

1-2 Environmental health and food sanitation activities by health inspectors

1-2-1 Public health centers took on pest eradication activities under the environmental section cooperated with municipal offices.

1-2-1-1 Malaria eradication activities

Indoor residual DDT spray was continued twice a year for seven years.

1-2-1-2 Control of filariasis

In Miyako islands , using malathion, indoor residual spray was conducted.

1-2-1-3 Dealing with Japanese encephalitis on Okinawa Island

Traditional larvae eradication methods were strengthened with the eradication of adult mosquitoes also launched using dusting machines in the evening.

1-2-2 Environmental health activities through public health organization

1-2-2-1 Distribution of safe water in the community

Chlorination of drinking water by village chief

1-2-2-2 Proper treatment of waste

1-2-2-3 Proper treatment of night soil

1-2-3 Food sanitation activities

1-2-3-1 Based on the Food Sanitation Law, public health centers began handling the issuance of permit for foodservice establishments.

The effects of the establishment of Public Health Centers on people's health in Okinawa after the World War the Second

Seisho Higa, M.D., M.p.h.
Director of Okinawa North Public Health & Welfare Office

The Effect of the Establishment of Public Health Centers on People's Health in Okinawa

1 Reduction of Number of Deaths from Acute Infectious Diseases During Childhood
- 1-1 The effect of immunization through PHN activities
- 1-2 The effect of health guidance, consultation, maternity and child clinics and others, for infant and childhood care
- 1-3 Prevention of extra uterine pregnancy and miscarriage through proper treatment of STD and health education
- 1-4 The pest eradication activities such as malaria and filaria, safe water supply and proper treatment of wastes and night soil

2 Prevention of Tuberculosis Death
- 2-1 Domiciliary treatment by PHN
- 2-2 Treatment at sanatoria in mainland of Japan
- 2-3 TB specialists from mainland of Japan
- 2-4 Assistance from the Japan Research Institute of Tuberculosis

3 Control of the progress of degenerative diseases such as cerebro-vascular accidents, heart diseases, etc.

The Effect of Social Factor and Eradication Measures on Malaria Incidence in Miyako and Yaeyama

Year	Miyako	Yaeyama	Remark	Meathods of Erad.
1945				
1946	7985	9050		
1947	46231	6594		Larva Eradication
1948	10590	799		Larva Eradication
1949	616	17	Immigration	Larva Eradication
1950	206	35	Immigration	Larva Eradication
1951	67	74	Immigration	Larva Eradication
1952	123	405	Immigration	Larva Eradication
1953	50	1610	Immigration	Larva Eradication
1954	500	2039	Immigration	Larva Eradication
1955	313	1865	Immigration	Larva Eradication
1956	124	2211	Immigration	Larva Eradication
1957	66	1730		Residual Spray
1958	12	370		Residual Spray
1959	1	58		Residual Spray
1960	0	4		Residual Spray
1961	0	5		Residual Spray
1962	0	0		
1963	0	0		
1964	0	0		

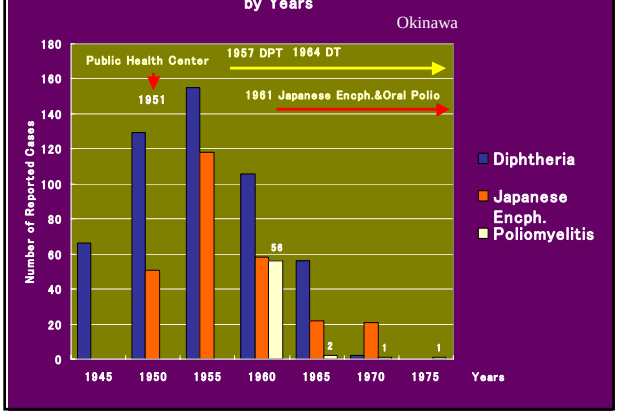
Data Source: Takao Kishimoto

Filaria Parasite identified by Blood Screening in each Health Center Areas 1965–1979, Okinawa Prefecture

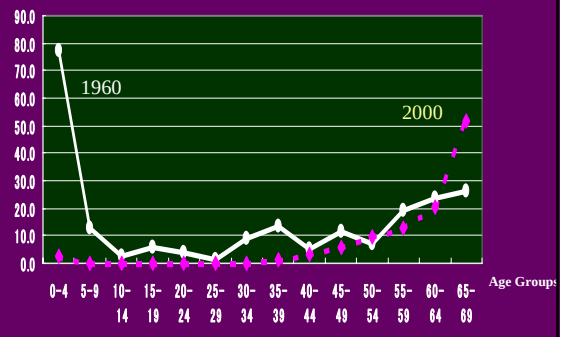
Fiscal Year	Miyako	Yaeyama	Nago	Ishikawa	Koza	Naha	Chuou	Total
1965	12607							12607
1966	3105							3105
1967	1282	3400						4682
1968		1116						1116
1969	177	133	1005					1315
1970	136	160						296
1971		107						107
1972	1	9	1	53				64
1973	8	6	3	14				31
1974	2	2	0	0	3	6		13
1975	3	0	0	0	0	20		23
1976	1	6	0	0	1	2	0	10
1977	1	3	0	1	0	0	0	5
1978	0	0		1	0	0	0	1
1979	0	0		0	0	0	0	0
Total	17323	4942	1009	69	4	28	0	23375

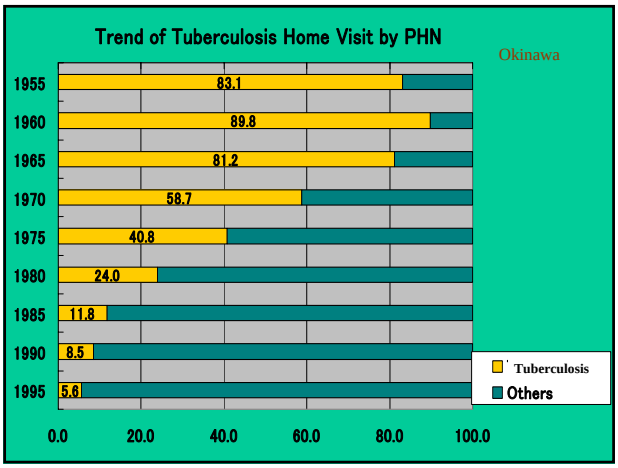
Data Source: Takao Kishimoto

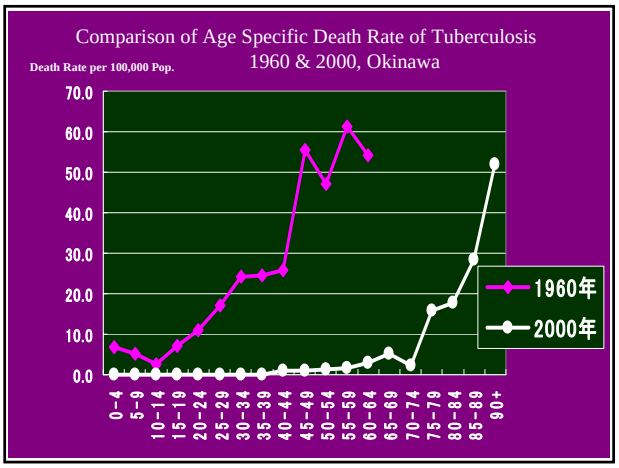
The Number of Reported main acute Infectious Diseases by Years

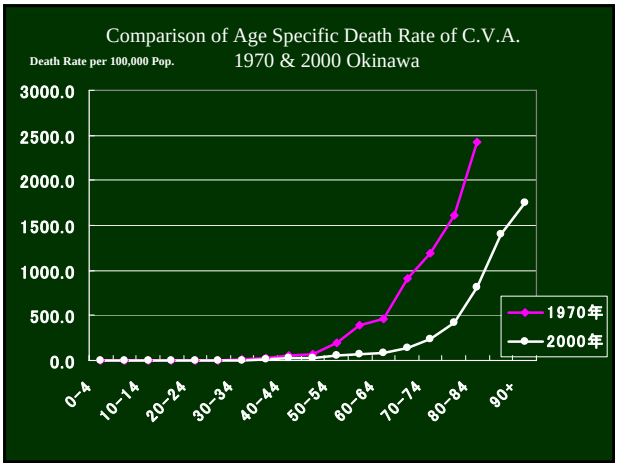


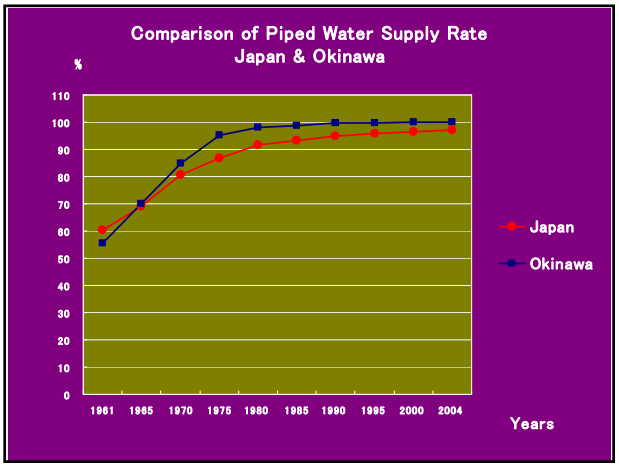
Comparison of Age Specific Pneumonia Death Rate in Okinawa (1960 and 2000)

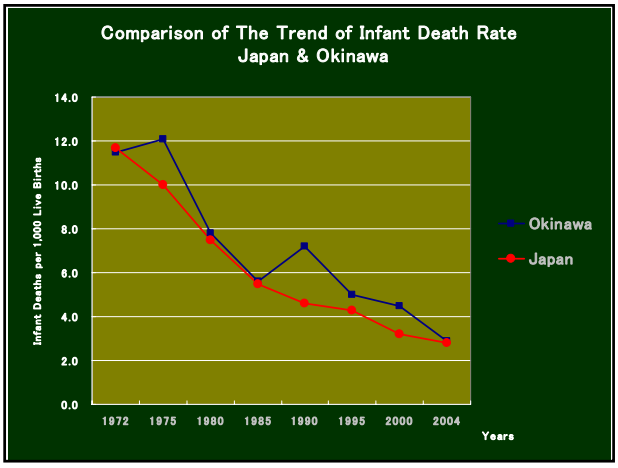


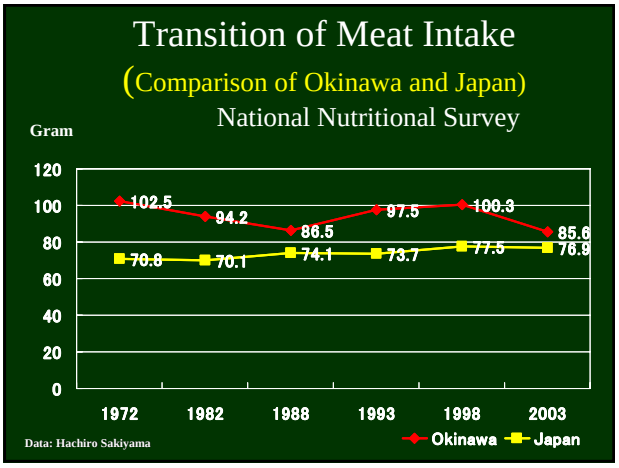

Trend of Tuberculosis Home Visit by PHN
Okinawa
1955
1960
1965
1970
1975
1980
1985
1990
1995
83.1
89.8
81.2
58.7
40.8
24.0
11.8
8.5
5.6
0.0
20.0
40.0
60.0
80.0
100.0
Tuberculosis
Others

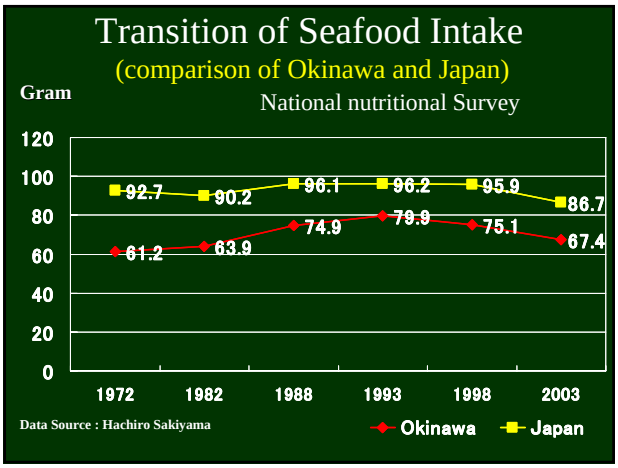

Comparison of Age Specific Death Rate of Tuberculosis
1960 & 2000, Okinawa
Death Rate per 100,000 Pop.
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75-79
80-84
85-89
90+
1960年
2000年

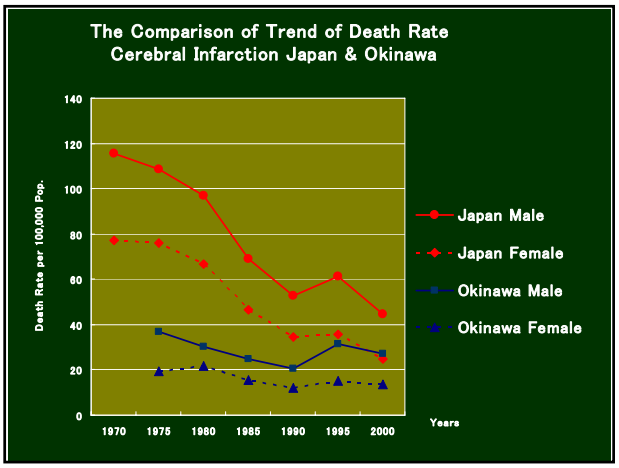

Comparison of Age Specific Death Rate of C.V.A.
1970 & 2000 Okinawa
Death Rate per 100,000 Pop.
3000.0
2500.0
2000.0
1500.0
1000.0
500.0
0.0
0-4
10-14
20-24
30-34
40-44
50-54
60-64
70-74
80-84
90+
1970年
2000年

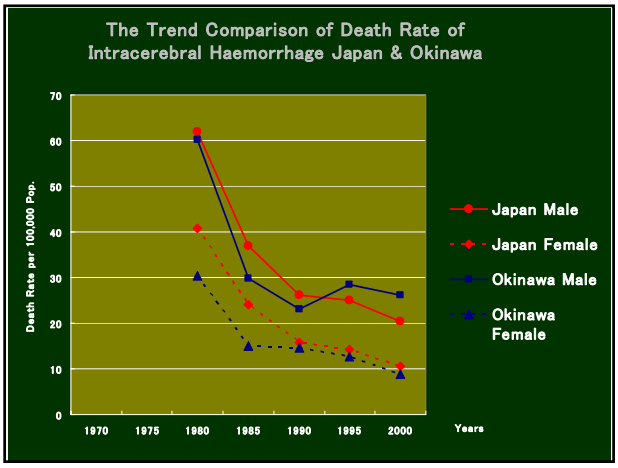

Comparison of Piped Water Supply Rate
Japan & Okinawa
%
110
100
90
80
70
60
50
40
30
20
10
0
1961
1965
1970
1975
1980
1985
1990
1995
2000
2004
Years
Japan
Okinawa

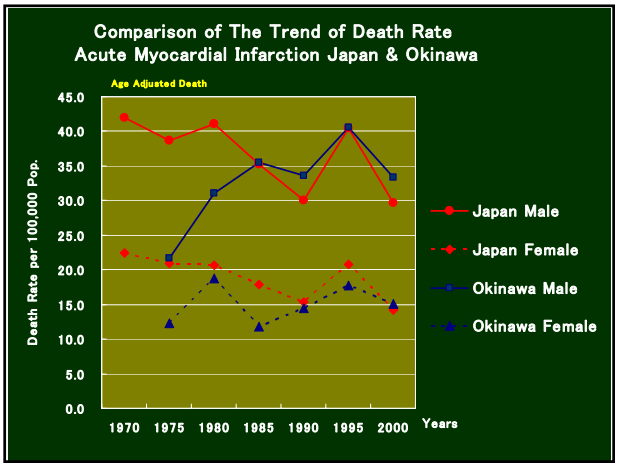

Comparison of The Trend of Infant Death Rate
Japan & Okinawa
Infant Deaths per 1,000 Live Births
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
1972
1975
1980
1985
1990
1995
2000
2004
Years
Okinawa
Japan

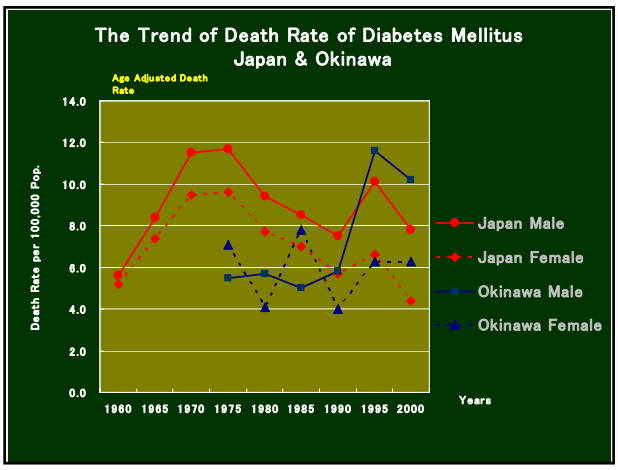

Transition of Meat Intake
(Comparison of Okinawa and Japan)
National Nutritional Survey
Gram
120
100
80
60
40
20
0
1972
1982
1988
1993
1998
2003
102.5
94.2
86.5
97.5
100.3
85.6
70.8
70.1
74.1
73.7
77.5
76.9
Data: Hachiro Sakiyama
Okinawa
Japan

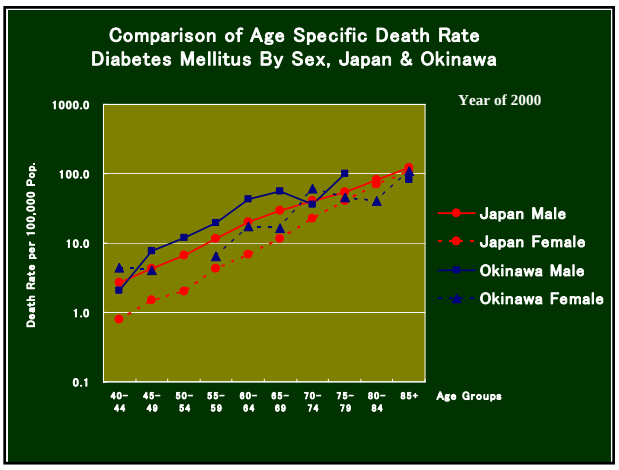

Transition of Seafood Intake
(comparison of Okinawa and Japan)
Gram
National nutritional Survey
120
100
80
60
40
20
0
92.7
90.2
96.1
96.2
95.9
86.7
61.2
63.9
74.9
79.9
75.1
67.4
1972
1982
1988
1993
1998
2003
Data Source : Hachiro Sakiyama
Okinawa
Japan

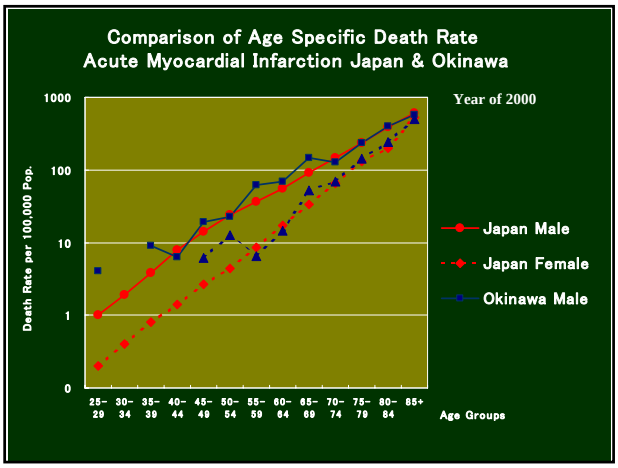

The Comparison of Trend of Death Rate
Cerebral Infarction Japan & Okinawa
Death Rate per 100,000 Pop.
140
120
100
80
60
40
20
0
1970
1975
1980
1985
1990
1995
2000
Years
Japan Male
Japan Female
Okinawa Male
Okinawa Female

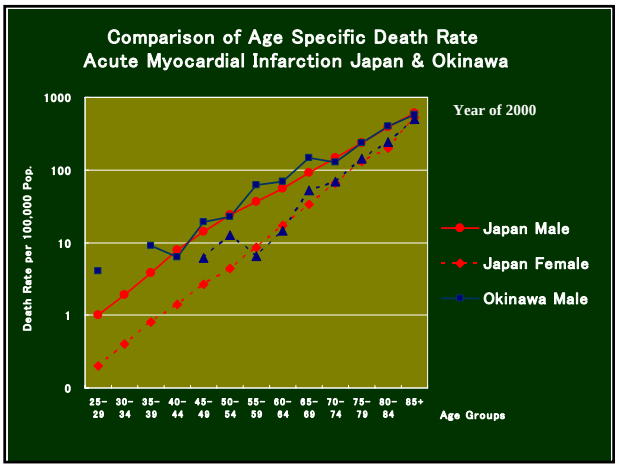

The Trend Comparison of Death Rate of
Intracerebral Haemorrhage Japan & Okinawa
Death Rate per 100,000 Pop.
70
60
50
40
30
20
10
0
1970
1975
1980
1985
1990
1995
2000
Years
Japan Male
Japan Female
Okinawa Male
Okinawa Female


Comparison of The Trend of Death Rate
Acute Myocardial Infarction Japan & Okinawa
Age Adjusted Death
Death Rate per 100,000 Pop.
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
1970
1975
1980
1985
1990
1995
2000
Years
Japan Male
Japan Female
Okinawa Male
Okinawa Female


The Trend of Death Rate of Diabetes Mellitus
Japan & Okinawa
Age Adjusted Death Rate
Death Rate per 100,000 Pop.
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
1960
1965
1970
1975
1980
1985
1990
1995
2000
Years
Japan Male
Japan Female
Okinawa Male
Okinawa Female


Comparison of Age Specific Death Rate
Diabetes Mellitus By Sex, Japan & Okinawa
Year of 2000
Death Rate per 100,000 Pop.
1000.0
100.0
10.0
1.0
0.1
40-
44
45-
49
50-
54
55-
59
60-
64
65-
69
70-
74
75-
79
80-
84
85+
Age Groups
Japan Male
Japan Female
Okinawa Male
Okinawa Female


Comparison of Age Specific Death Rate
Acute Myocardial Infarction Japan & Okinawa
Year of 2000
Death Rate per 100,000 Pop.
1000
100
10
1
0
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75-79
80-84
85+
Age Groups
Japan Male
Japan Female
Okinawa Male


Comparison of Age Specific Death Rate
Acute Myocardial Infarction Japan & Okinawa
Year of 2000
Death Rate per 100,000 Pop.
1000
100
10
1
0
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75-79
80-84
85+
Age Groups
Japan Male
Japan Female
Okinawa Male

Contribution of U.S. Administration on the training of physicians and nurses in Okinawa

Masao Maeshiro., M.D., FACS
University of Hawaii, Okinawa Chubu Hospital

I Physician

1945 to 1967

End of the War till the opening of formal training hospital

1947 Dispatch of scholarship students to Medical Schools in Japan
Succeeded by GOJ scholarship students in 1953 and lasted till 1972
Total number of graduates 1092

1952 Dispatch of GARIOA students to U.S.A. till 1972
Total number 10 physicians, mostly observer for 1 year

1953 Started training at US Army Hospital till 1960?
Total number

1963 WHO fellowship training at Denmark and Great Britain, South East Asia, South Pacific
Total number 15 physicians

1965 Training at National Hospital in Tokyo

1967 Founding Medical Library till 1972

Individual contract with specialist as a teacher

1959 Leprosy 3 months at Airakuen

1963 General surgeon 6 months at Naha Hospital

1967 to 1971

Founding of formal training hospital to secure the physicians to practice locally
Contract with University Hawaii to provide teaching staffs, 12 to 15 each year
Total number trained till 1971, 75 physicians

1967 Dispatch of physicians to Hawaii as observer, 3 physicians, 4 months

1969 Dispatch of physicians for further residency or fellowship training to the U.S. started in.U.S. Administration days and continuing until now total number 97 physicians

1972 to present

Reversion to Japan and thereafter

Training program continued even after reversion to Japan, new contract with University of Hawaii after a year of interruption

To maintain hospital ER

To maintain 24 hour service of the hospital

To maintain global standard practice

Recognition of U.S. styled training

Clinical oriented on the job training

Wide basis of training – general rotating

Internship, and general specialist not confined in only one subspecialty

Group practice with peer review

II Nurses

1946 Establishment of Nursing School

1949 Arrival of Colonel Juanita Watterworth till 1960

1951 Change of admission requirement to senior high school graduate

1953 Training at U.S. Army Hospital till 1971?

Training in Tokyo –National Institute of Public Health

1954 Consignment of selected nurses to Ryukyu University for 1 year till 1970

1957 Training in the U.S. –Hawaii, San Francisco

1966 Training at Taiwan、1967？

Contribution and Influence of U.S. administration on the Training of Physicians and Nurses in Okinawa

Masao Maeshiro, M.D., F.A.C.S.
University of Hawaii
Okinawa Chubu Hospital

No. of Physicians in Okinawa

1945	**21 were drafted and only 6 survived the war**
1946	**64 Returned from military service**
1950	**131 All served in Government Hospital**

Measures taken to maintain health care to civilian

1. Dispatch of scholarship students to medical school (1949~1972)
2. Adoption of physician assistant 60→25 short period of training who had military service in Medical corps
3. Public Health Nurse, stationed in small island
4. Introduction of foreign physician from Taiwan and Korea

Dispatch of scholarship students to Japanese Medical Schools

Started in 1949

- Tuition and cost of living
- Obliged to return to Okinawa after National Board Examination for medical licensure
- Stationed at Government Hospital

To provide further postgraduate training (1)

1952 GARIOA students to the United States, till 1960
10 selected physicians, mostly as observer, some received MPH

1954 Started the training at U.S. Army Hospital for selected 22 physicians, 6 month, till 1963

1963 WHO fellowship training for selected 15 physicians -to Denmark, Great Britain, South East Asia, Tokyo

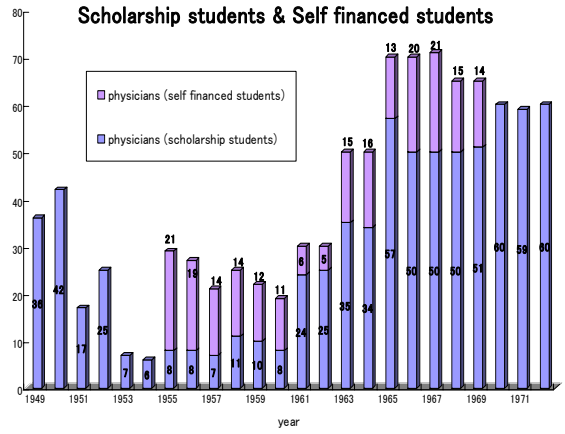
To provide further training (2)

Contract with specialist individually

1959 Dr. Kibby, leprosy specialist worked at Airakuen for 3 months

1963 Dr. Lorne M. Phillips, General Surgeon worked 6 month at Naha and Koza hospital

	Scholarship students	Self financed students	Total
Physician	742	216	958
Dentist	80	65	145
Pharmacy	75	111	186



Drop in the return rate of scholarship student

1950 97%
1958 90%
1965 44%
1964 Recommendation by Dr. Shoei Yamauchi, criticized severely the management of health care of civilian

1. Establishment of Training Hospital
2. Foundation of Medical Library
3. Consideration to build Medical School

1965 North Wing under construction

1965 North Wing under construction

1966 Koza Nursing School

Foundation of Postgraduate Training Hospital

1967

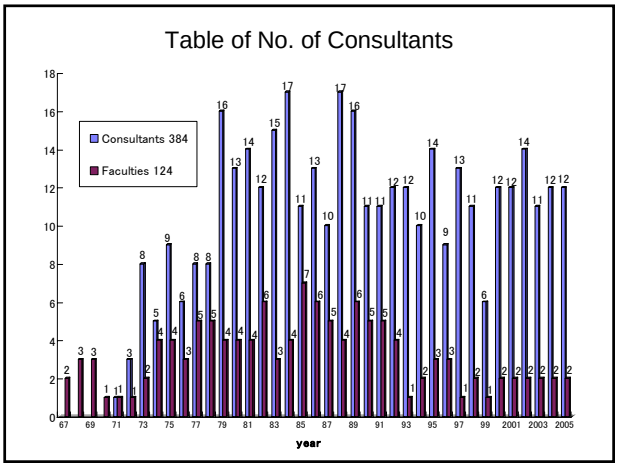
Contract with University of Hawaii and Pentagon and State Department to provide teaching staffs in Medicine, Surgery, Pediatrics, OB-GYN, Physical Therapy and Pathology, Laboratory Technician, 15 in total

1967 **3 physicians sent out to Hawaii for training 4 months**

Medical Library opened ~1972

1968 **ECFMG Test Center was approved until 1994**

1969 **Started sending to the U.S. for further formal residency or fellowship training, lasting even now, 97 physicians studied in U.S.**



Reversion to Japan in 1972 and thereafter

Training program continued, new contract with University of Hawaii

To maintain active ER of the hospital

To maintain 24 hour service of the hospital

To maintain global standard practice

The hospital without training program can not be regarded as FIRST CLASS

- Wm. Osler -

Recognition of U.S. styled training

Clinically oriented on the job training

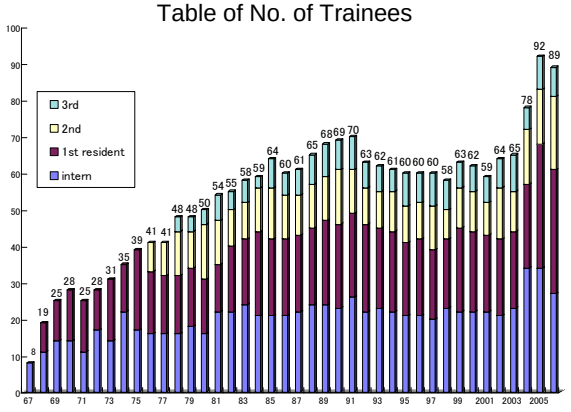
Wide basis of skill and knowledge

not confined in narrow specialty

general medicine, general surgery, etc.

Group practice with peer review

Table of No. of Trainees



Result of Training Program

No. trained at Chubu Hospital	692
No. stayed in Okinawa	514 (74.3%)
Students visited as observer	70~200/year
Students for Clinical Clerkship	6 Medical Schools
Visitors from mainland Japan	39 hospital

Training for the nurses

1945	On the job training to care the injured
1946	Establishment of Nursing School, 3 years
1949	Arrival of Colonel Juanita Watterworth, RN
1951	Change of admission requirement to senior high school graduate
1953	Training at U.S.Army Hospital started 4 months, 4 nurses Dispatch of nurses to Tokyo
1954	Consignment of selected nurses to Ryukyu University for 1 year until 1971
1957	Training in the U.S. -Hawaii, San Francisco
1964	Training in Taiwan

U.S. influence on the Nursing care in Okinawa before reversion to Japan

Improvement in basic nursing skill

Global standard charting, much superior than Japanese standard of the era

Higher status of hospital nurses

The U.S. occupation and its influence to Okinawan longevity
~Transition of Okinawan longevity under the U.S. governing~

Makoto Suzuki M.D. & Ph.D
Professor Emeritus University of the Ryukyus
Okinawa Research Center of Longevity Science

Demographically, the life expectancy rate and centenarian's rate are commonly used to indicate the longevity of community or regions. These indexes are represented by numerals per 100,000 populations in the regions. However, it is not appropriate to use them to mark small region as "the village of longevity," because there is possibility that it may be misdirected by accidental factors.

There are many longevity regions especially in the developing countries, which are reported in the various congresses and mass media. The common topics of such reports are the existence of curious supercentenarian or high centenarian's rate. However, high centenarian's rates are not arisen by accidental affairs. It is naturally expected that centenarian's rate should be high at the high life expectancy regions. If the high centenarian's rate appears in low life expectancy region, the reliability of the registration system might be poor. In this view, data of Okianwan longevity has been highlighted as a reliable registration region throughout all of the world.

I am requested to explain on the subject of "The U.S. occupation and its influence to Okinawan longevity" with the subtitle of "Transition of Okinawan longevity under the U.S. governing." I am asked to answer the question "Has the U.S. occupation brought out the benefits to Okinawan longevity?" It is said that this suggests an important assignment in the medical field. The answer to the question may bring about the solution to the problem, whether human longevity is regulated by the heritable factors or by the environmental factors. If the U.S. occupation has brought about the enhanced effect on Okinawan longevity, longevity might be affected by the environment. If it has no or adverse effect, the longevity might be mainly affected by heritable factors.

As I am allowed to use only 10 minutes for my presentation, I would like to give my conclusion in simple words before discussion. At this moment I can not definitely say that any significant sign showing the benefit to Okinawan longevity has been found out under the U.S. governing. I even assume that the adverse effect by the U.S. may have

acted as a brake to the longevity. There is no place to oppose the idea that Okinawan livelihood and public health were significantly improved by the support of the U.S. governing. However they have not contributed to the longevity.

Figure 1 shows the rapid increase of the number of centenarians in Okinawa and Japan. In 1970 (S45), the centenarians were officially counted for the first time. At that time, Okinawa had totally nine centenarians. Before this census survey, Dr. N. Nagata privately made a research of longevity at Okinawa in 1962, and reported one centenarian named Matsu Teruya (Female / 102 years old). Dr. Nagata expressed that "Such a centenary life was once in a blue moon." Therefore it is impossible for us to investigate the effect on Okinawan centenarians under the U.S. governing.

Figure 1 : The Transition of Number of Centenarians in Okinawa and Japan

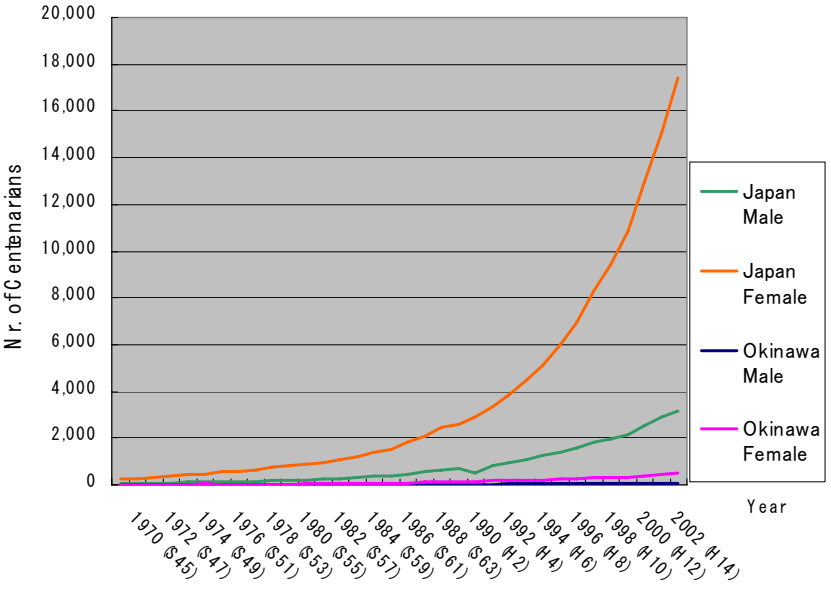


Figure 2 : The transition of the life expectancy at birth Japan and Okinawa

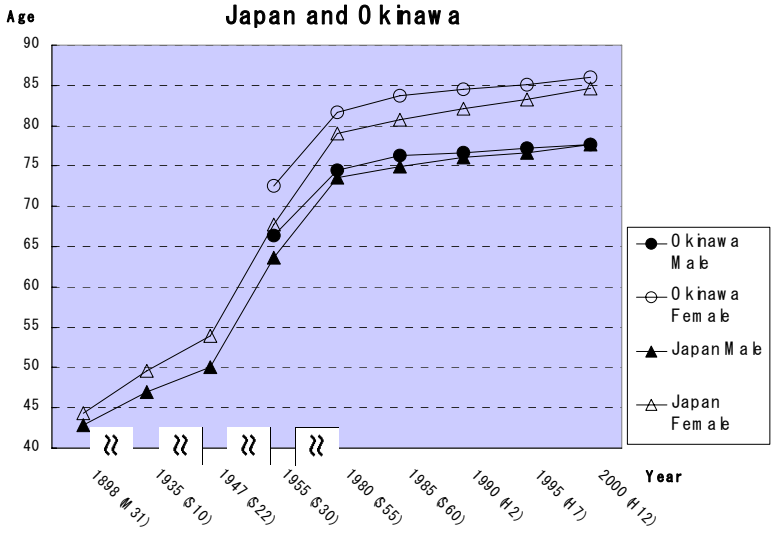


Figure 2 shows the increasing transition of the life expectancy at birth between Japan and Okinawa. The original data were cited from the life table recorded by Department of Statistic at Government of the Ryukyu Island and Japanese Health and Welfare Ministry. In 1891, the first life table was made by Japanese government.

In 1947 (S22), Japanese life expectancy reached to age 50. Before 1950 (S25), due to the inadequacy of the registration system in Okinawa, there was a wide discrepancy between the numbers reported by

the local governmental administration office and the department of public health at that time. Therefore, these numbers cannot be used to statistic analysis. Consequently I have used the data after 1955 (S30), when the registration system was properly operated. The data of 1955 shows that Okinawan life expectancies of both male and female are higher than that of Japanese. Also the life expectancy of Okinawa was much higher than it of the U.S. in both male and female, and was ranked as high as the countries with advanced welfare system such as Norway, Sweden, and Denmark at that period.

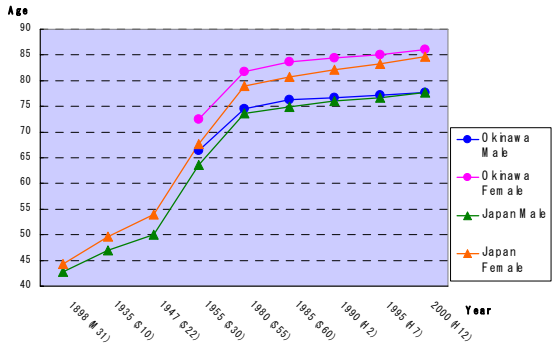
In 1977, Okinawa returned to Japan from the U.S. In 1980, both Japanese life expectancy and Okinawan life expectancy grew upward rapidly. However the growing rate both in Japanese and Okinawa were almost same grade. That is the reason why I express that no particular sign of the U.S. influence in Okinawa, was recognized during the U.S. governing period. Thereafter both Japanese and Okinawan life expectancies have still steadily grown up, but the gap between Japan and Okinawa life expectancies have been gradually narrowing down. At 2000, the life expectancy of Japanese male has overtaken it of Okinawan male. The growth of life expectancy of Okinawan female has slowed down, and it is concerned that it may be overtaken by Japanese female as well in the near future. Moreover another trend has been recognized. That is a gap between male and female life expectancies has widened over the years especially in Okinawa. It can be easily considered these two gaps are due to the prevalence of the metabolic syndrome caused by adapting too much Western life style. For this reason, now a days, many of Western countries have been taken strong interest in “Okinawa Way” of the traditional life style to adapt into own life style.

The U.S. occupation and its influence to Okinawan longevity

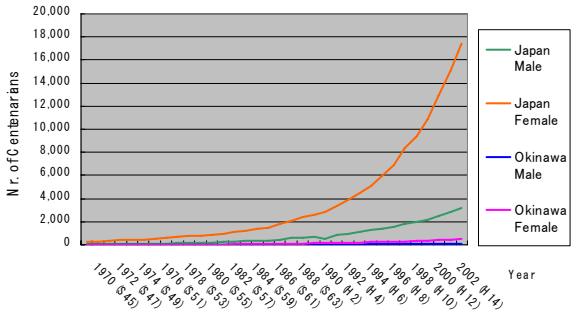
~Transition of Okinawan longevity under the U.S. governing~

Makoto Suzuki M.D. & PhD
Professor Emeritus University of the Ryukyus
Okinawa Research Center of Longevity Science

The transition of the life expectancy at birth in Japan and Okinawa



The Transition of Number of Centenarians in Okinawa and Japan



The Number of Octogenarians and Centenarians in Okinawa and Japan

	Octogenarians		Centenarians	
	Okinawa	Japan	Okinawa	Japan
1872 (M5)	2,005		21 *1	388 *2
1928 (S3)	3,471	307,500	1	287 *3
1958 (S33)	5,638	616,000	3	
1975 (S50)	14,869	2,840,510	28	548

*1 1738-1876 Ikai-houshou (the award given to centenarians from the king)
*2 1908 (M41) Tokyo-manchouho-sha
*3 1928 (S3) Gotaiten

Average Life Expectancy at birth of the high-ranked countries

Rank	Country	Year	Male	Female
1	Norway	1946-50	69.3	72.7
2	Okinawa	1955-57	66.4	72.5
3	New Zealand	1950-52	68.3	72.4
4	England/Wales	1952	67.1	72.4
5	Sweden	1946-50	69	71.6
6	Holland	1947-49	69.4	71.5
7	U.S.A.	1949-51	65.5	71
8	Canada	1950-52	66.3	70.8
13	France	1950-51	63.6	69.3
15	Japan	1955	64	68

Caloric Restriction, Energy Balance and Healthy Aging: Evidence for an Impact on Pre-and Post-War Generations of Okinawans in Okinawa and Hawaii

Bradley Willcox, D. Craig Willcox, Makoto Suzuki, Hidemi Todoriki, Qimei He, Kamal Masaki, John Grove, Randi Chen, Katsuhiko Yano, J. David Curb.

Pacific Health Research Institute (B.W., D.C.W., K.M., K.Y., K.F, J.D.C.), Honolulu, Hawaii; Honolulu Heart Program, Kuakini Medical Center (B.W., K.Y., K.F., K.M., J.D.C), Honolulu, Hawaii; Department of Geriatric Medicine and Medicine, John A. Burns School of Medicine, University of Hawaii (B.W., K.M., J.D.C.), Honolulu, Hawaii; Department of Public Health, University of Hawaii (J.G.); College of Nursing, Okinawa Prefectural University (D.C.W.), Okinawa, Japan; University of the Ryukyus (M.K., H.T.) and Okinawa Research Center for Longevity Science (B.W., D.C.W., M.K.).

Background: Long-term "caloric restriction (CR)" also known as "under-nutrition without malnutrition," is a robust means of reducing age-related diseases and extending lifespan in multiple species but the effects in humans are controversial. Most human populations who have experienced low calorie intake have suffered from malnutrition and poor health due to poor quality diets. However, the pre-World War 2 generation in Okinawa had a low calorie intake but a high quality diet, combined with high physical activity, and this generation exhibits several physical and health characteristics associated with the CR phenotype. These characteristics include: small body size, low BMI (body mass index) at younger ages, low risk for chronic diseases, high physical and cognitive function, and a very long life expectancy. These phenotypic characteristics appear to be disappearing in post-war generations. Therefore, we hypothesize that CR has contributed to the robust health seen in older Okinawans and that post-war lifestyle changes may eliminate many of these health advantages.

Methods: We analyzed six decades of cross-sectional population data for evidence that CR may have played a role in the healthy aging seen in older Okinawans. We then tested several of these factors in a prospective study of longevity in Okinawan-and other Japanese Americans in Hawaii known as the Hawaii Lifespan Study (HLS). The HLS is a prospective cohort study within the Honolulu-Heart Program and Honolulu Asia Aging Study. We studied a total of 5,820 men (mean age of 54 years with range of 45-68 years) who were free of morbidity and functional impairments at baseline. These men were followed for up to 40 years (1965-2005) to assess overall and healthy survival in

relation to CR-linked factors identified in older Okinawans in Okinawa. Healthy survival was defined as survival to a specified age (75, 80, 85, or 90 years) without incidence of 6 major chronic diseases and without physical and cognitive impairment.

Results: Data on caloric intake, energy expenditure, other nutritional variables, anthropometric measures, age-related hormones and morbidity/mortality outcomes support a caloric restriction phenotype for elderly Okinawans and suggest that CR may have contributed to their exceptionally healthy longevity. These data include: low caloric intake, an energy deficit at younger ages, low body mass index, and relatively high plasma DHEA levels at older ages with concomitant low risk for morbidity/mortality. These data in older Okinawans in Okinawa are supported by prospective findings of older Okinawans and other Japanese-Americans in the Hawaii Lifespan Study. Data from younger, post-war generations of Okinawans suggest that over-nutrition and lack of physical activity, resulting in positive energy balance may be undoing some of these CR-linked health attributes in Okinawa.

Conclusions: These data are consistent with the well-known animal literature on CR-linked phenotypes and longevity and these findings provide support for the CR hypothesis in humans. Further study of the potential role of CR for improving human health and longevity is warranted. Further study of the potential health risks of over-nutrition and obesity in post-war generations of Okinawans and other populations is also warranted.

This work was supported by contract N01-HC-05102 from the National Heart, Lung, and Blood Institute, contract N01-AC-4-2149 and grants5 U01 AC019349-O5, R01 AC027O60-01 (Hawaii Lifespan Study), and K08 A622788-02 from the National Institute on Aging, and grant 2004-0463frcm the Hawaii Community Foundation. Also supported by the Japan Ministry of Health, Labor and Welfare (Okinawa Centenarian Study) and the Obuchi Foundation (H. Todoriki).

Caloric Restriction, Energy Balance and Healthy Aging

Evidence for an Impact on Pre-and Post-War Generations of Okinawans in Okinawa and Hawaii

B Willcox, D Willcox, H Todoriki, Q He,
R Chen, K Yano, K Masaki,
J Grove, T Donlon, J Curb, M Suzuki

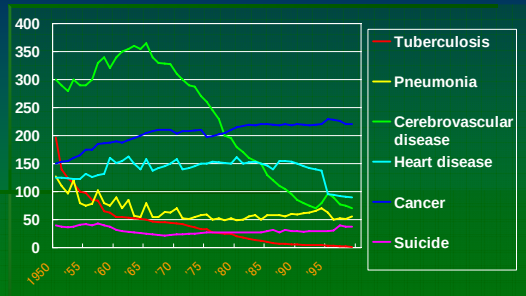
Pacific Health Research Institute; Kuakini Medical Center; Department of Geriatric Medicine, John A. Burns School of Medicine, University of Hawaii; Okinawa Prefectural University; Okinawa Research Center for Longevity Science; University of the Ryukyus

Okinawa Centenarian Study
The Research Team

HYPOTHESES

- Healthy aging in populations is related to common risk factor profiles including biological, lifestyle and sociodemographic factors
- Assuming basic public health infrastructure and avoidance of risk-taking behavior (e.g. smoking), energy balance (calories consumed vs. calories expended) becomes a dominating factor
- This is mediated through insulin-related metabolic pathways
- The early influence of the US presence has been positive
- Later dietary influence from both the US and mainland Japan contributed to obesity and metabolic syndrome

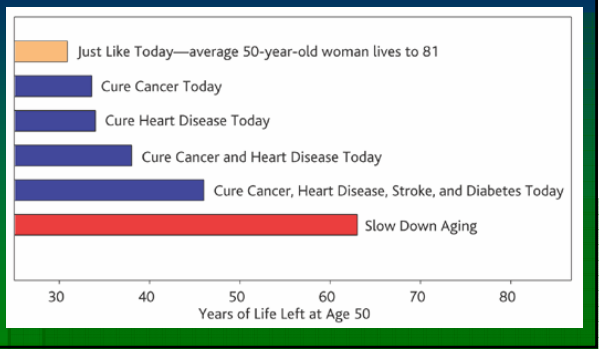
Age Standardized Mortality in Japanese Males 1950-1999
年齢調整死亡率の年次推移



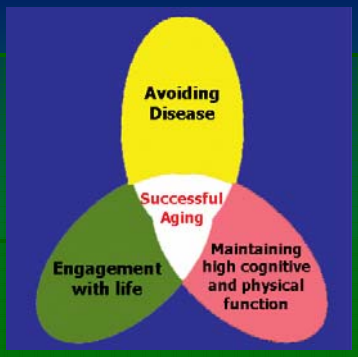
Early Gains in Life Expectancy were Largely Due to US-based Public Health Interventions

Time	Change in Average (Years)	% Contribution to Change in Average Life Expectancy by Age-group					
		0-4	5-14	15-34	35-49	50-64	65+
1955-60	1.72	55.3	9.3	22.2	14.1	6.5	-7.4
1960-65	2.42	46.5	5.3	11.9	7.4	14.7	7.2
1965-70	1.58	32.0	3.8	5.9	7.1	22.0	28.0
1970-75	2.42	15.3	3.1	2.7	9.0	25.4	37.3
1975-80	1.62	16.4	3.3	3.6	12.1	17.1	40.4
1980-85	1.43	15.9	2.6	3.4	12.5	11.0	53.8
1985-90	1.14	7.0	2.0	1.0	15.6	18.4	50.3

Since the main health risks now are chronic diseases and aging affects all of them-→We need to better understand mechanisms of aging



Successful Aging



Rowe & Kahn (1998)

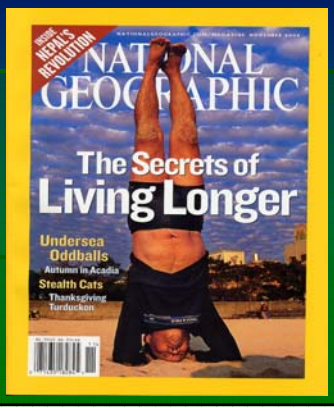
Older Okinawans Tend to Avoid Disease

Age Adjusted Death Rates (per 100,000 people)

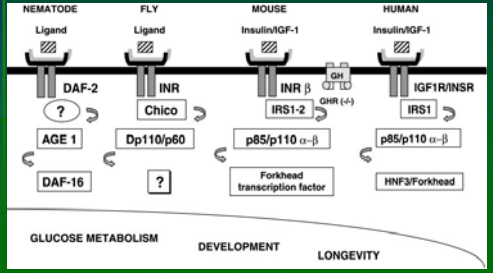
Rank	Location	Life Expectancy	CHD	Cancer	Stroke	All Causes
1	Okinawa	81.2	18	97	35	335
2	Japan	79.9	22	106	45	364
3	Hong Kong	79.1	40	126	40	393
4	Sweden	79.0	102	108	38	435
8	Italy	78.3	55	135	49	459
10	Greece	78.1	55	109	70	449
18	USA	76.8	100	132	28	520

WHO 1996, Japan Ministry of Health and Welfare 1996

High Physical Function and Active Engagement with Life



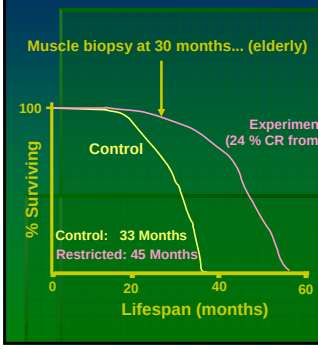
The Evolutionarily Conserved Insulin/IGF-1 Signaling Pathway*



* Barbieri M, Bonafe M, Franceschi C, Paolisso G. Insulin/IGF-I-signaling pathway: an evolutionarily conserved mechanism of longevity from yeast to humans. *Am J Physiol Endocrinol Metab* 2003;285:E1064-E1071.

Low Calorie Intake Turns on Genes that Leads to Slower Aging

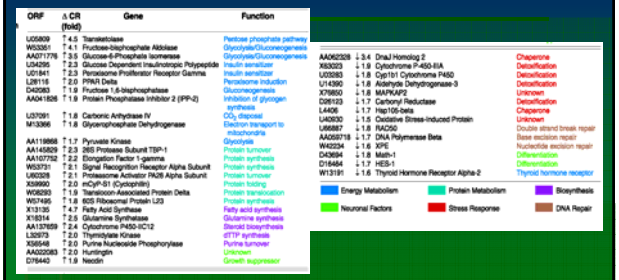
Lee *et al.*, Science 285, 1390 (1999)



At 30 months muscle biopsy showed that with over 6,000 genes linked to aging →

84% of genes had improved function in the low calorie group many affected by insulin signaling

Caloric restriction–induced alterations in gene expression

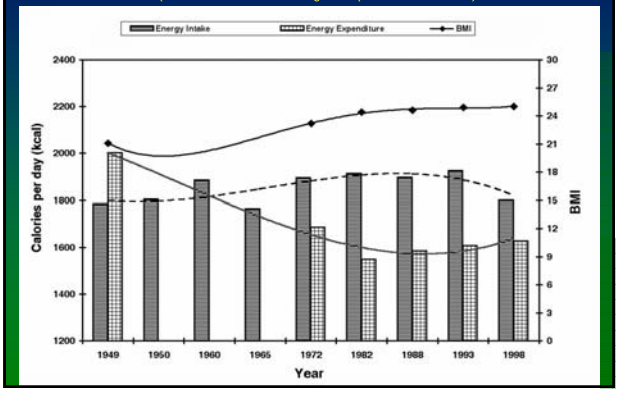


Science (1999) **285**:1390-1393

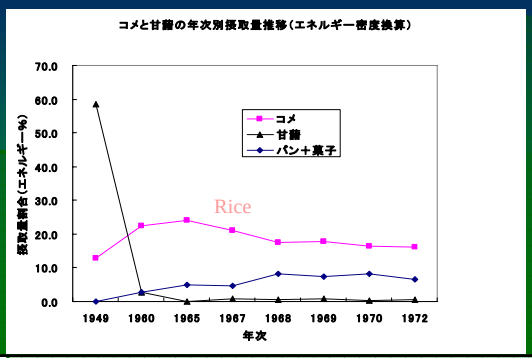
Okinawan Centenarian and Well Fed North Americans Researchers

Caloric Intake, Energy Balance and BMI in Okinawa 1949-1998

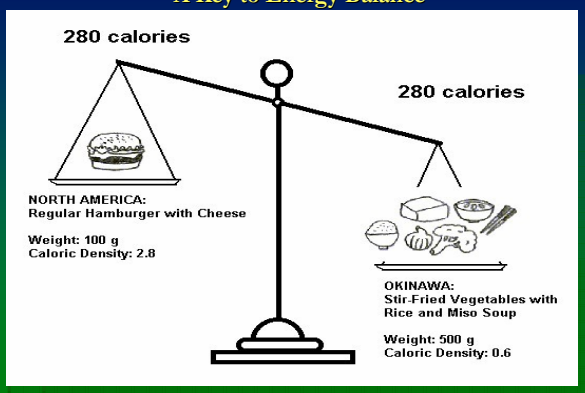
(Willcox B et al. Mech Age Devp 2006 Submitted)



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



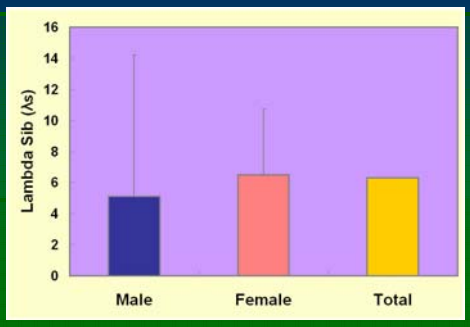
Caloric (Energy) Density in Okinawa A Key to Energy Balance



Willcox BJ, Willcox DC, Suzuki M The Okinawa Diet 2004

危険因子どうする　？？？

Significant Genetic Component to Exceptional Longevity Phenotype (Centenarianism) in Okinawa



Willcox B, Hsueh WC et al. *Internat Gen Epidem Soc Meeting*, 2005

Healthy male participant, 101 years →

Hawaii Lifespan Study

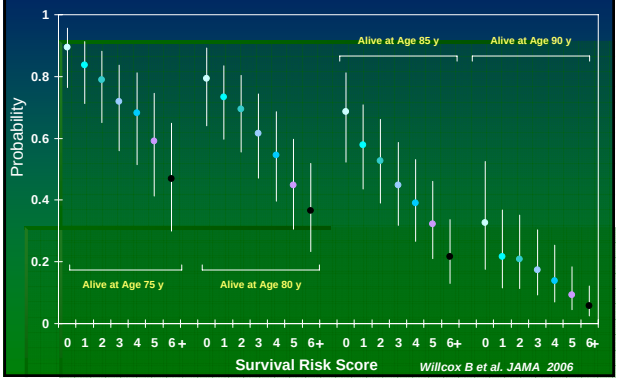
Insights on Okinawan Aging from long-lived Okinawans in Hawaii

Nine Keys to a Healthy Old Age

(Willcox B et al. JAMA 2006)

	Death		Poor Health	
Risk Factors	**OR (95% CI)**	**p**	**OR (95% CI)**	**p**
Biological				
Overweight at Mid-life (BMI ≥25)	1.13 (1.00 - 1.28)	0.044	1.49 (1.19 - 1.86)	<.001
High Glucose (≥ 200 mg/dl)	1.64 (1.41 - 1.91)	<.001	1.65 (1.21- 2.25)	0.002
High Triglyceride (≥ 150 mg/dl)	1.11 (0.99 - 1.25)	0.08	1.26 (1.03 - 1.54)	0.030
Hypertension (≥ 140/90 or on meds)	1.45 (1.29 - 1.63)	<.001	1.61 (1.29 – 2.00)	<.001
Low Grip strength (< 39 kg)	1.25 (1.11 - 1.40)	<.001	1.24 (1.01 - 1.52)	0.045
Lifestyle				
High Alcohol (3+ drinks/day)	1.58 (1.34 - 1.88)	<.001	1.61 (1.11 - 2.34)	0.010
Ever Smoker	1.94 (1.72 - 2.18)	<.001	1.23 (1.01 - 1.52)	0.040
Sociodemographic				
Low Education (< 12 Years)	----	----	1.56 (1.28 - 1.91)	<.001
Unmarried	1.59 (1.27 – 2.00)	<.001	----	----

Maximizing Your Odds for a Long and Healthy Life



Willcox B et al. JAMA 2006

Conclusions

- Early positive influence of US due to extensive public health interventions, including water treatment, parasite control, and infectious disease control
- Later problems with metabolic syndrome (obesity, high insulin levels, high blood sugar, high blood pressure, poor cholesterol profile)
- Future is uncertain

Same genes but different obesity outcomes Gene--Environment Interactions are Key !

Acknowledgements

Supported by the Japan Society for Promotion of Sciences, the US National Institutes of Health (NHLBI, NIA), the Hawaii Community Foundation, the Obuchi Foundation and the people of Okinawa and Hawaii.

Longevity in Peril: An Exploration of Mortality Changes in Okinawa 1985-2000

Craig Willcox
Okinawa Prefectural College of Nursing, Okinawa, Japan

Early post-war public health interventions by American and local Okinawan administrations that focused upon the building up of public health infrastructure and the elimination of infectious disease were largely responsible for the rapid increases in life expectancy experienced in the early post-war period. However, the longevity advantage experienced by Okinawa prefecture relative to other prefectures has been gradually eroding over the past couple of decades with life expectancy growth rates among the slowest in Japan. Men in particular have been experiencing slow increases in life expectancy. This has led to what is called the *26 Shock* in Okinawa, reflecting the fact that Okinawan men dropped from among the top 5 prefectures within Japan in 1995 to 26th place (in life expectancy at birth) according to the most recent available statistics from the year 2000. Lifestyle changes that involve an uncoupling of energy intake and expenditure as well as other negative health behaviors may be contributing to emerging problems of obesity, diabetes, increased cardiovascular risk factors, higher rates of liver disease and higher suicide rates for large subsets of the population. An examination of specific causes of death that contributed to the sudden drop in life expectancy between 1995 and 2000 for Okinawan men reveals that lifestyle related diseases such as cerebrovascular disease, heart disease, liver disease and diabetes all played a role, particularly among middle-aged Okinawan men. Long term trends (since 1985) indicate that slower rates of decrease in cardiovascular diseases (stroke and heart disease), continuing high death rates from lung cancer, a slower rate of decrease in stomach cancer mortality and increasing rates of liver disease and suicide (compared to other prefectures) were important contributing factors. Without strong public health intervention that focuses upon both micro (health behavior) and macro (social structure and social policy) approaches, Okinawa will likely experience further decreases in average life expectancy relative to other prefectures in the coming decades.

The Nutrition Transition in Postwar Okinawa: The Relationship between Dietary Changes and Body Weight

Hidemi Todoriki
Department of Environmental and Preventive Medicine, Faculty of Medicine, University of the Ryukyus, Okinawa, Japan

Background: Okinawa has among the world's longest-lived population. Recently, this has begun to change. The life expectancy of men in Okinawa Prefecture fell to 26th from 4th among the 47 prefectures of Japan, according to the most recent Ministry of Health, Labor and Welfare statistics (2000). Although life expectancy in Okinawa, particularly for men, had been slowing relative to other prefectures for around 17 years, the fall was none the less precipitous. Evidence of longevity in Okinawa has generally come from two indices, that of average life expectancy, and that of the centenarian ratio (number of centenarians per one hundred thousand population).

Trend of Life Expectancy: As for growth in life expectancy, rates for both men and women in Okinawa have been slowing relative to other prefectures since 1985, and the growth between 1995 and 2000 was only 0.42 years for men(the lowest rate among the 47 prefectures of Japan) and 0.93 years for women(46th among the 47 prefectures of Japan). All-cause mortality for younger, post-war generations is higher than the national average while all-cause mortality for older people in Okinawa is lower, with the cross-over taking place at about 55 years of age. Although women in Okinawa currently remain the longest-lived in Japan, at current slow growth rates in life expectancy it is predicted that they too will relinquish their number one position in the not too distant future. As far as the other often used index of longevity, that is , the ratio of centenarians, for Okinawa the ratio for the year 2005 stood at 54.37 (per 100,000) vs. 51.88 for Kochi prefecture, and 22.23 for Japan as a whole thus it appears that although Okinawa still retains the lead in this area, other prefectures have been catching up here as well. The relative drop for younger generations seems to be due to multiple causes with increased risk for mortality from certain lifestyle related diseases figuring prominently.

Nutrition Transition and Body Weight in Okinawa: Other aspects of the nutrition transition, such as changes in body weight and height, can also be seen in Okinawa by looking at school health statistics of children aged 6 to 15 years old. The weight of school children from Okinawa was lower than that of their mainland Japanese counterparts during the post-war period but differences contract rapidly in the first half of the 1970's, male and female school children from Okinawa then exceed the level of all-Japan in the

latter half of 1970's, and then fall slightly below all-Japan averages again in the mid to late 1980's. The yearly change in body height never exceeded that of all-Japan in the way that body weight did although similar trends can be witnessed. The nutrition transition in Okinawa, particularly with regards to increased fat intake and increased bodyweight, may be related to socio-political, socio-economic and socio-cultural changes that were set in motion either directly or indirectly during U.S. administration beginning in 1945 and although still being felt, were particularly strong up until reversion to Japan in 1972.

Future of Okinawan Longevity: Life expectancy for men in Okinawa has fallen sharply relative to other prefectures and although at present women still retain their lead in Okinawa, if present trends continue, they too will fall. To put things in perspective, life expectancy rankings do not have a huge meaning anymore because differences between regions in the whole of Japan have been gradually decreasing. However, life expectancy is a comprehensible index that represents the concept of “longevity” and therefore has great appeal to the average person, after all, who doesn’t want to live a long and healthy life? In particular it is thought that the decrease in life expectancy rankings will exert a negative influence for Okinawa for the “longevity brands” of health food and the tourism industry. The “longevity crisis” that Okinawa has been dealing with since the latest life expectancy figures came out in 2000, was actually already pointed out as far back as ten years ago (or longer) by some investigators who have been following the health trends. Although public policy has been slow to respond and the meaning of "ten lost years" may be large for Okinawa. Public health authorities may also be limited in the extent to which they can counteract current lifestyle habits that are promoted by large multinational corporations (i.e. high-fat fast foods). On the other hand, the large life expectancy gains that took place in Nagano over the past few decades should not be overlooked, especially with regards to the beneficial effects that public health policy exerted in bringing about positive changes in health-promoting behavior.

In that sense, it is necessary to look at things from a long-term perspective and plan ahead using the latest scientific knowledge and tools at our disposal. An epidemiological study with a large scale of population size is necessary, as is priority given to a population strategy of health education beginning with school children and aiming at life-long health promotion for the average person.

The Nutrition Transition in Postwar Okinawa: The Relationship between Dietary Changes and Body Weight

Hidemi Todoriki

Department of Environmental and Preventive Medicine, Faculty of Medicine,
University of the Ryukyus, Okinawa, Japan

3

- **Learning from the United States experience on Okinawa can help ensure the success of the Iraqi occupation, ・・・**
(沖縄における合衆国の経験から学ぶことは、イラクの占領の成功を確実にするのを助けることができる、・・・)

By Alexander Cooley and Kimberly Zisk Marten at Barnard College, Columbia University. The New York Times July 30, 2003, Wednesday,

4

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

Hokkaido+Tohoku
Kanto
Chubu
Kansai
Chugoku +Shikoku
Kyusyu
Okinawa

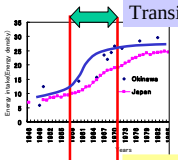
Body weight difference happens drastically in Okinawa 1962-1974.

Overlapped with the 'Nutrition transition era'.

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

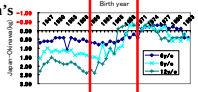
Nutrition transition of fat intake between Okinawa and Japan

Transition generation



1972Reversion to JPN

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



1954米国余剰農産物資法による学校給食へ援助
1960パン給食実施
1960学校給食法
1962学校給食完全実施
米国援助による寄与が大きい。

B-Yen | **US dollar** | **Japanese Yen**

6

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

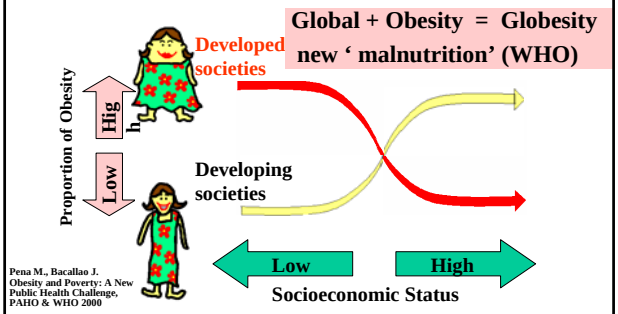
U. S. food reaches the customer

7

Canned Pork Luncheon Meat

Import Amount: Okinawa as No.1 in Japan

Relationship between obesity and socioeconomic status



9

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

Factor of Rise

- Decrease of infantnt 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

10

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.

11

Nihei dehbiru!

Thank you very much !

お疲れ様

12

Recent Trends in Health Status of Okinawa: Comparison with whole nation

Tomohiro Hirao
Health Policy and Management, Kagawa University

Although Okinawa has been known as a land of longevity, the recent report from the ministry of health suggested that the reputation was questioned. The male ranking of life expectancy among 47 prefectures was dropped to 26th in 2000. Female still keeps the top of the country but the difference with the second place shrank. What is going on in the islands and when this trend started? Recently I have a chance to attend *the Apple-Pineapple Project*, in which causes of health outcome differences among Japanese 47 prefectures were investigated. In this presentation, I introduce the findings concerning Okinawa.

Diseases and conditions contributed to the extension of the life expectancies

From 1975 to 2000, life expectancy of whole nation has been extended 5.92 years in male and 7.61 years in female. During the same period, the extension of life expectancy in Okinawa was 5.49 years in male and 7.05 years in female (prefecture ranks were 44th and 45th respectively). To understand what diseases and/or conditions contributed to the extension of life expectancies, we decomposed the life tables of 47 prefectures with Pollard method. In Okinawa, the contributions of stroke (especially cerebral infarction), ischemic heart disease, and suicide in both sexes and malignant neoplasms (especially stomach cancer) in female

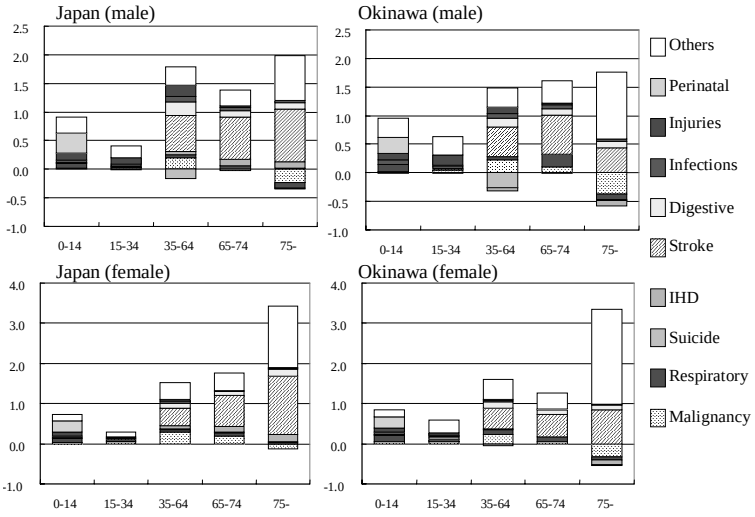


Fig1. Contributed years for the extension of life expectancy (1975-2000)

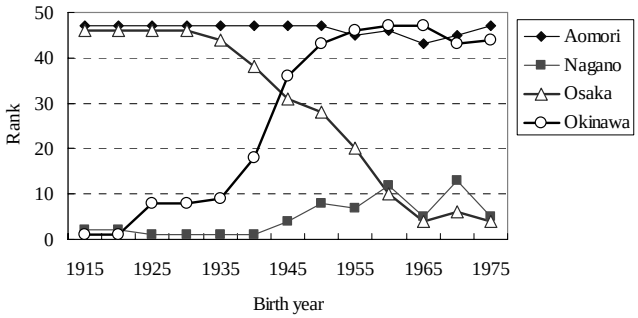


Fig2. Trend of CLSM ranking in male

were smaller than those of whole nation (Fig1). Above all ischemic heart disease and suicide shortened the life expectancy.

Birth cohort contributed to the population health outcome

To understand the cohort effects for population health, we developed cohort life stage mortality (CLSM), which shows the expected mortality rate during certain period for each birth cohort. We estimated the CLSM of 1915-1975 birth cohorts and their ranking. In Okinawa, clear ranking shift occurred between 1935 and 1950 birth cohorts (Fig2). The birth cohorts born before the war (over 70 years old, the elderly) were in the top health status group but the cohorts born after the war (under 60 years old, the young) were in the worst group.

Characteristics of health status in the young

To clarify the characteristics of health status in Okinawan young, we analyzed the trends of age and disease specific Standardized Mortality Rate (SMR) for three periods, 1973-82, 1983-92 and 1983-2002. In both sexes, SMRs of 20-50 years old were higher than whole nation and increased in cerebral hemorrhage, diabetes, liver diseases and suicide.

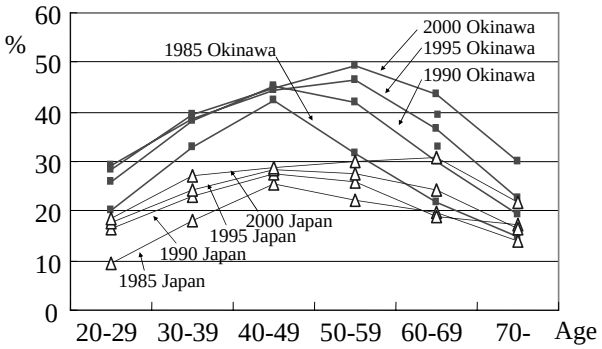


Fig3.Trends of obesity % in male (1985-2000)

Data source: Rojinhoken check-ups (Okinawa), National health and nutrition survey (Japan)

What factors affected the heath status of the young? According to the trends of health-checkups results, numbers of high cholesterol (Total cholesterol >=220mgdl), diabetes (FBS>=126 or HbA1c>=6.5 or BS>=200), liver function abnormality and obesity (BMI>=25) were increasing. Especially the increase of obesity might be much higher than whole nation (Fig3). Although we do not have good evidence on the relationship between these factors and health outcomes, it is suggested that the rapid change of risk factors affected the health outcomes in Okinawan young. Furthermore, these changes might be affected by the rapid socio-economical and cultural changes after the war.

Okinawa experienced the drastic social changes in the short period. Rapid changes in life style, diet, exercise, alcohol, smoking and so on, might be distal causes of health outcomes. Because same phenomenon might occurred in other areas of Japan in slower pace, we have to keep eyes on Okinawa as a mirror of whole nation.

Recent Trends in Health Status of Okinawa: Comparison with whole nation

Tomohiro Hirao,MD.,PhD.
Health Policy and Management,
Faculty of Medicine, Kagawa University

Menu

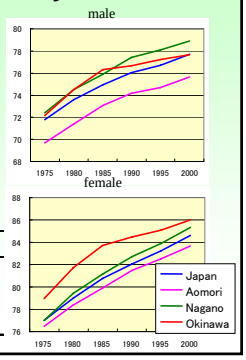
1. Diseases and conditions contributed to the extension of the life expectancies
2. Birth cohort contributed to the population health outcome
3. Characteristics of health status in the young people

1. Diseases and conditions contributed to the extension of the life expectancies

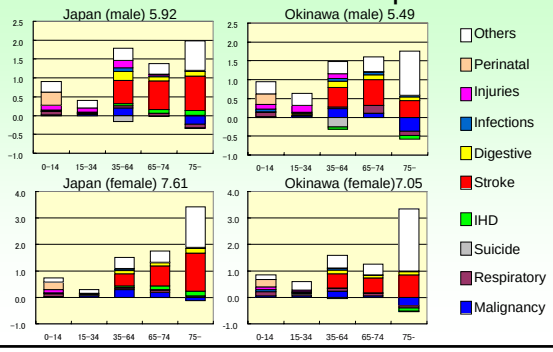
Extension of Life Expectancy 1975-2000

From 1975 to 2000, life expectancy of Japan has been extended 5.92 years in male and 7.61 years in female. During the same period, the extension of life expectancy in Okinawa was 5.49 years in male and 7.05 years in female (prefecture ranks were 44th and 45th respectively)

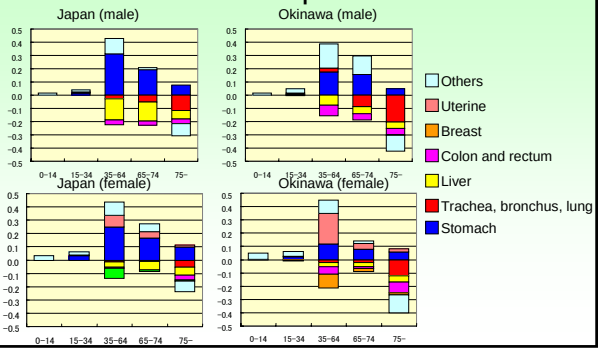
	Life expectancy 1975	Life expectancy 2000	Ranking in 2000	Extension	Rnking of Extension
male					
Okinawa	72.15	77.64	26	5.92	44
Japan	71.79	77.71		5.49	
female					
Okinawa	78.96	86.01	1	7.61	45
Japan	77.01	84.62		7.05	



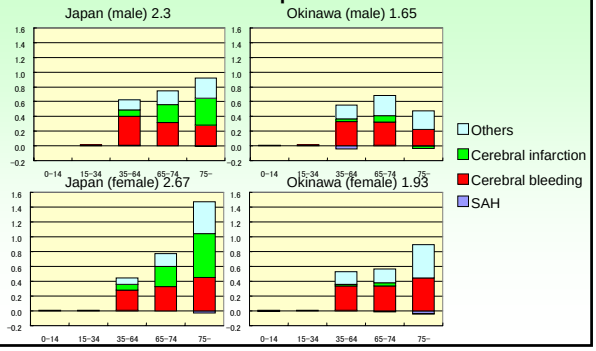
Diseases and conditions contributed to the extension of the life expectancies



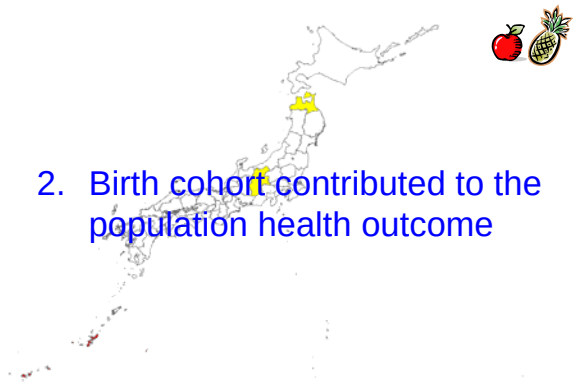
Cancers contributed to the extension of the life expectancies



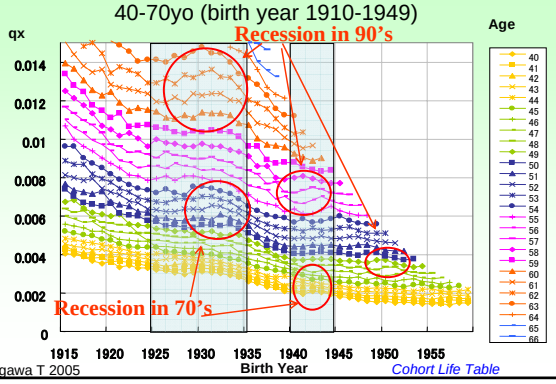
CVDs contributed to the extension of the life expectancies



2. Birth cohort contributed to the population health outcome

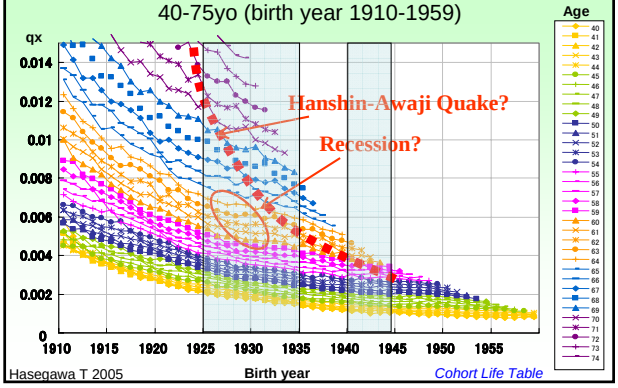


Age-Specific Mortality (qx) of Japanese male 40-70yo (birth year 1910-1949)



Hasegawa T 2005 *Cohort Life Table*

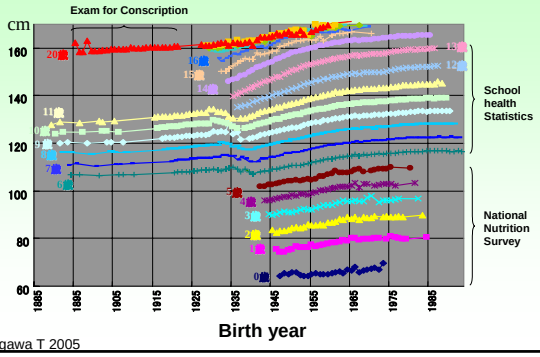
Age-Specific Mortality (qx) of Japanese female 40-75yo (birth year 1910-1959)



Hasegawa T 2005 *Cohort Life Table*

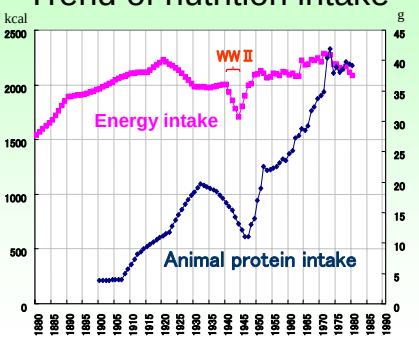
Trend of Body Height

Japanese male 0-20 yo (birth year 1888-1990)



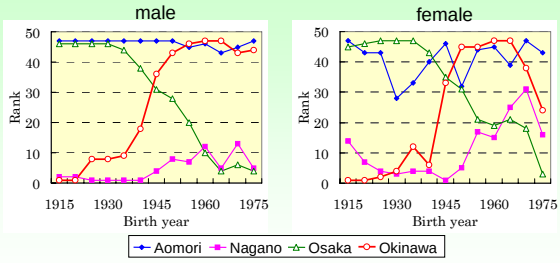
Hasegawa T 2005

Trend of nutrition intake

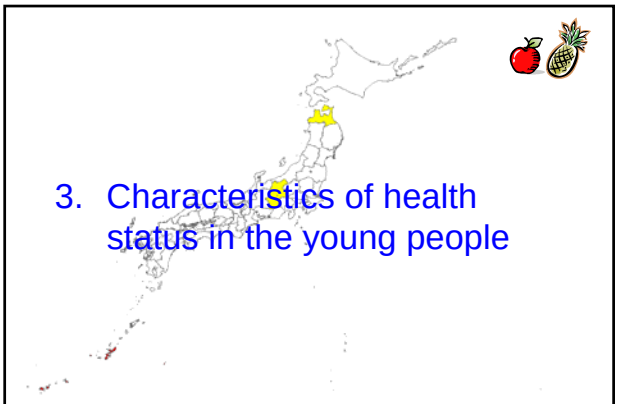


National Nutrition Survey

Trend of CLSM Ranking



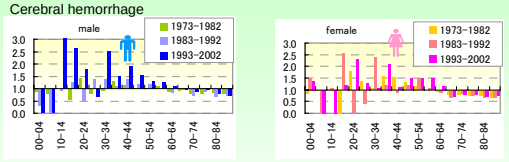
CLSM: cohort life stage mortality, which shows the expected mortality rate during certain period for each birth cohort.



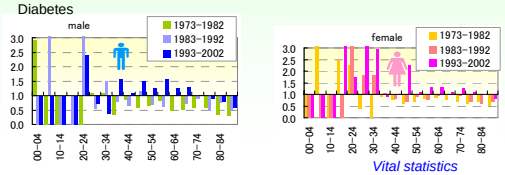
3. Characteristics of health status in the young people

Ratios of Mortality Rate (Okinawa vs. Japan)

Cerebral hemorrhage



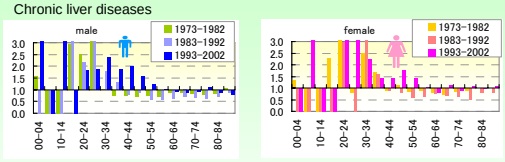
Diabetes



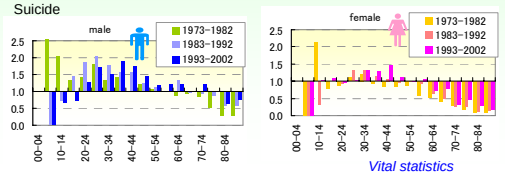
Vital statistics

Ratios of Mortality Rate (Okinawa vs. Japan)

Chronic liver diseases



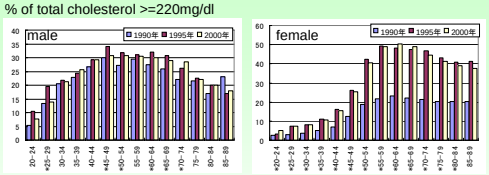
Suicide



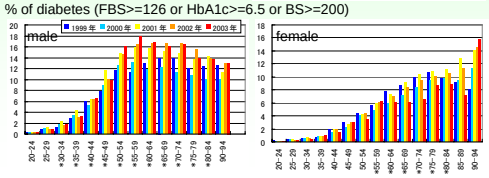
Vital statistics

Trends of check-ups results

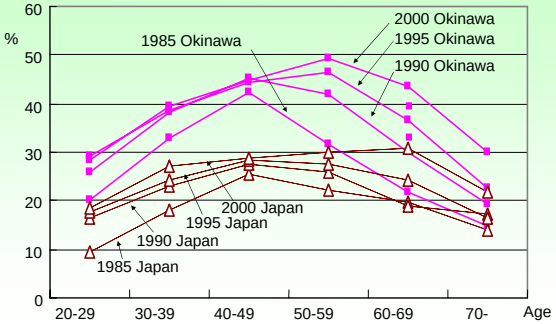
% of total cholesterol >=220mg/dl



% of diabetes (FBS>=126 or HbA1c>=6.5 or BS>=200)

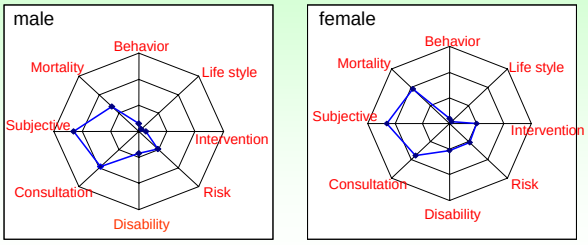


Trend of obesity % in male (1985-2000)



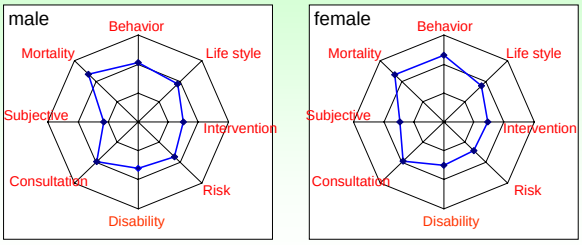
Data source: Rojinhoken check-ups (Okinawa), National health and nutrition survey (Japan)

Prefecture Ranking of Health Related Statistics (Okinawa)



Matsumoto.K, Hasegawa.T 2002

Prefecture Ranking of Health Related Statistics (Nagano)



Matsumoto.K, Hasegawa.T 2002

Summary and Conclusions

- Extension of life expectancy between 1975-2000 was small
- Contributions of cerebral infarction, ischemic heart disease and suicide were smaller than whole nation.
- Ischemic heart disease and suicide shortened the life expectancy.

Summary and Conclusions

- The cohorts born before the war (over 70 years old) were top health status in the country
- But the cohorts born after the war (under 60 years old) were in the worst group.

Summary and Conclusions

- Okinawa experienced the drastic social changes in the short period. Rapid changes in life style, diet, exercise, alcohol, smoking and so on, might be distal causes of today's health outcomes.
- Because same phenomenon might occur in other areas of Japan in slower pace, we have to keep eyes on Okinawa as a mirror of whole nation.

Thank you!

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