

● このスライドの著作権は、原則として著作者に帰属します。著作権法上認められた場合を除き、その利用には原則として著作者の許諾が必要です。

As a general rule, the copyright of the slides belongs to the author. In principle, the author's authorization is required for their use, except in cases recognized by the copyright law.

**【Session 1】 Fifteen Years Since 3.11: Progress through Challenges**

**Session 1-3**

**The Comprehensive Health Check  
What We've Learned Over 15 Years and  
What Lies Ahead  
1320-1335**

**Department of Diabetes, Endocrinology, and Metabolism, Fukushima Medical University**

**Health Promotion Center Director, Department of the Health Survey and Office of the Comprehensive Health Check  
and Health Promotion**

**Radiation Medical Science Center for the Fukushima Health Management Survey**

**SHIMABUKURO Michio**

# Topics

## 1. Lessons from 15 years of the CHC\*

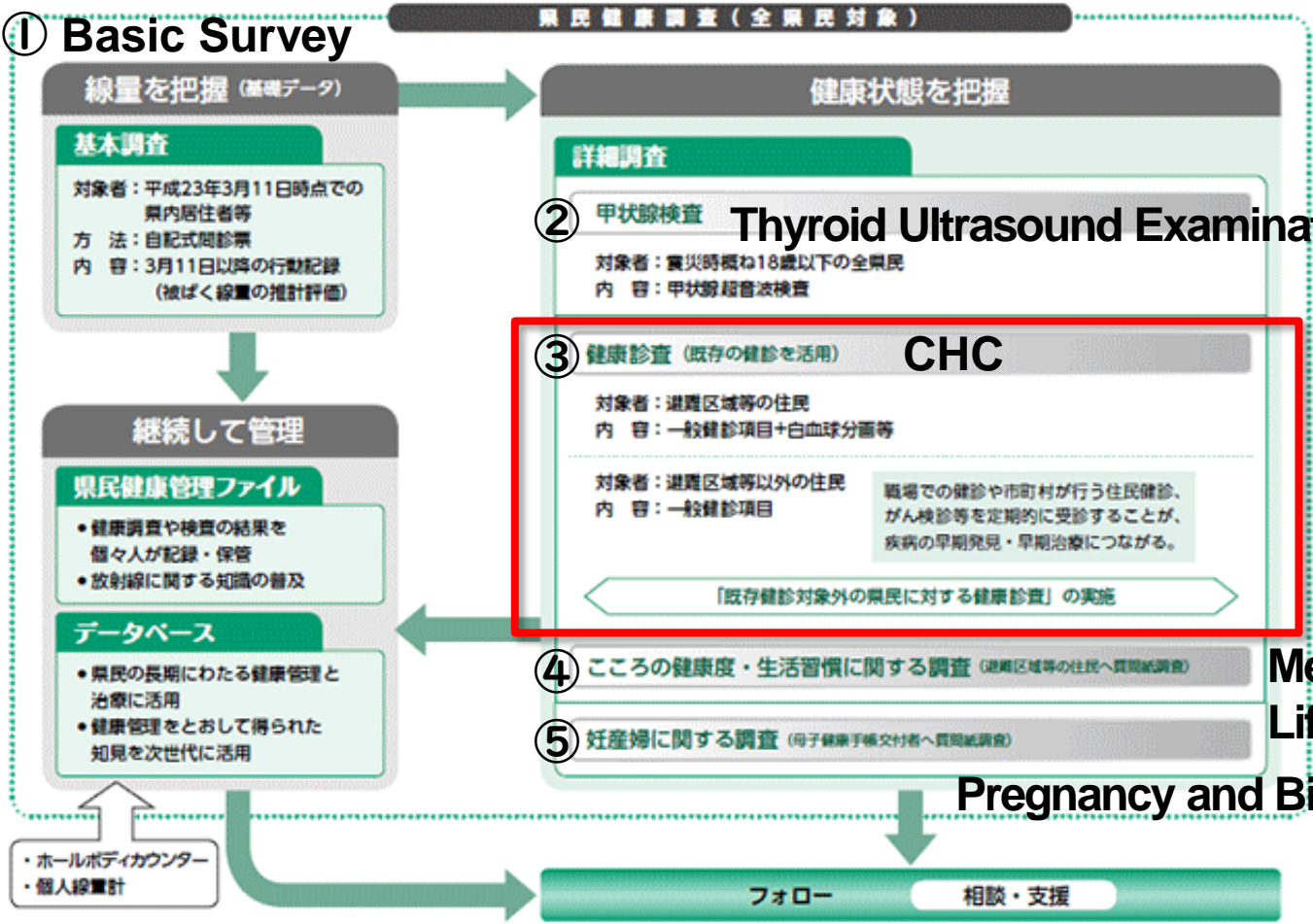
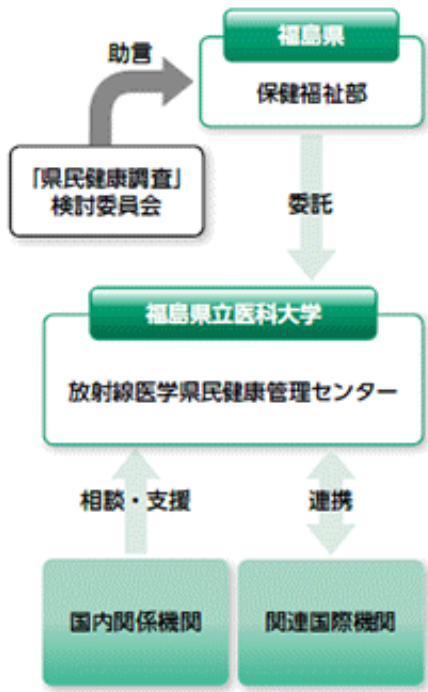
\*Comprehensive Health Check

## 2. NCD<sup>†</sup>, evacuation & psychological burden

<sup>†</sup>non-communicable diseases = lifestyle-related diseases

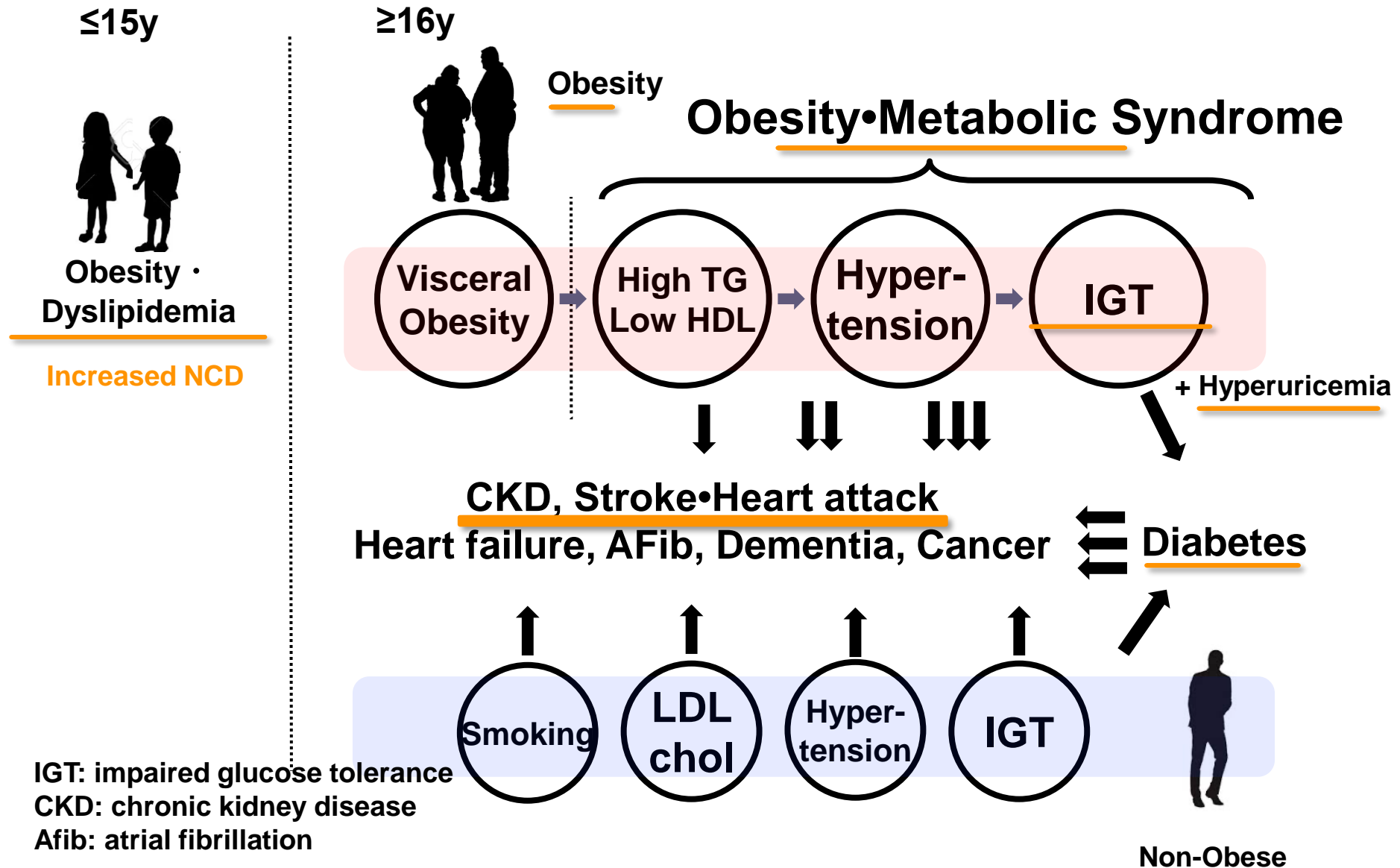
## 3. Considering the future from CHC

# FHMS includes 5 surveys



CHC: Comprehensive Health Check  
 FHMS: Fukushima Health Management Survey

# Increased NCD after the disaster



IGT: impaired glucose tolerance  
CKD: chronic kidney disease  
Afib: atrial fibrillation

# NCD after the nuclear accident: what we know from CHC

## ≤15y: Children

A certain number of children presented with obesity, dyslipidemia, hyperuricemia, liver dysfunction, hypertension, and IGT. Obesity improved in the follow-up survey, but the improvement of lipid abnormalities in boys was delayed.

## ≥16y

- **Increased:** obesity, metabolic syndrome, IGT & diabetes, chronic kidney disease, hyperuricemia, and polycythemia
- **Increased but improved:** blood pressure, LDL-cholesterol (residents under treatment increased), liver dysfunction (decreased due to the improvements of daily physical activity and frequency of breakfast intake)
- **No changes:** WBC counts and differentials within the evacuated areas: no direct effects observed

CHC: Comprehensive Health Check  
IGT: impaired glucose tolerance

## Lifestyle- and disaster-related factors and NCD risk: CHC participants ≥40 yo: 10,120 men & 13,961 women

↑ = increase ↓ = decrease blank = insignificant - = not analyzed	obesity		leanness		Hyper-tension		Diabetes mellitus		Dyslipi-demia		Liver dysfunction		CKD	
	M	W	M	W	M	W	M	W	M	W	M	W	M	W
Aging		↑	↑	↓	↑	↑	↑	↑		↑	↓	↑	↑	↑
Obesity	-	-	-	-	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Leanness	-	-	-	-	↓	↓		↓	↓	↓				
Excercise ≥ 2x/w									↓		↑			
Sleep satisfaction								↓						
EtOH < 40g/d			↓		↑			↓	↓	↓				
EtOH ≥ 40g/d					↑	↑			↓		↑	↑	↓	
Currently smoking			↑	↑			↑		↑					
Evacuation		↑			↑				↑	↑	↑	↑		
Change of jobs	↑		↓	↓			↑		↑		↑			
Depressive symptoms											↑	↑		
Radiation concerns	↑													
Participation in recreation	↓		↓								↓			↑

↑ = increase  
 ↓ = decrease  
 blank = insignificant  
 - = not analyzed

Based on the report  
 submitted to the 41st  
 Prefectural Oversight  
 Committee Meeting for the  
 Fukushima Health  
 Management Survey

# Topics

## 1. Lessons from 15 years of the CHC\*

\*Comprehensive Health Check

## 2. NCD<sup>†</sup>, evacuation & psychological burden

<sup>†</sup>non-communicable diseases = lifestyle-related diseases

## 3. Considering the future from CHC

# Estimating psychological burden

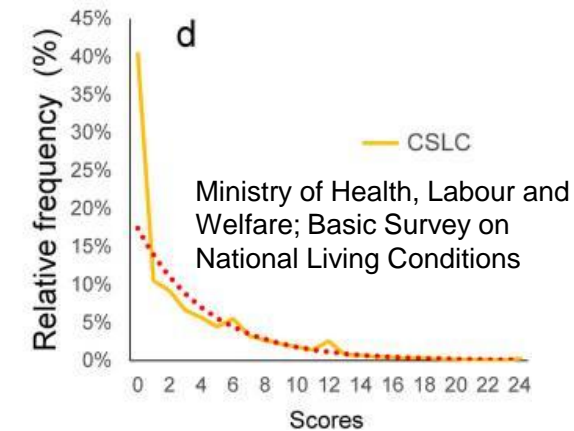
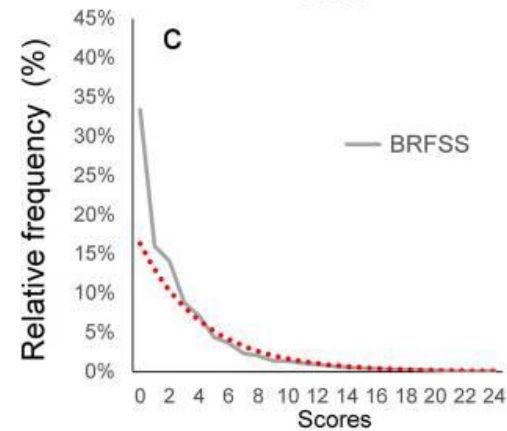
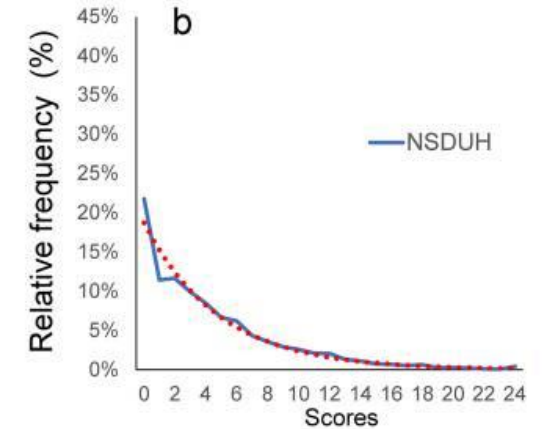
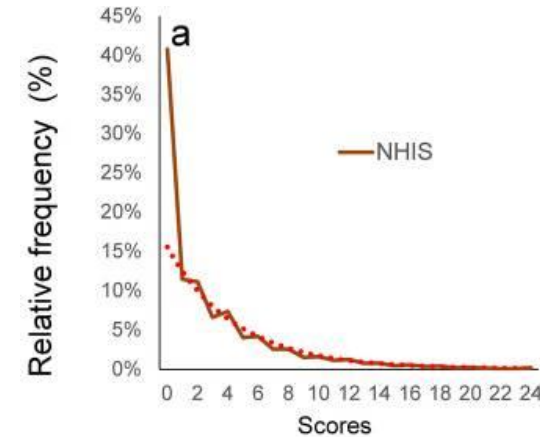
≥13 points indicates psychological burden

## Kessler-6 Scale (K6)

Q1. During the past 30 days, about how often did you feel ...	All of the time	Most of the time	Some of the time	A little of the time	None of the time
a. ...nervous?	1	2	3	4	5
b. ...hopeless?	1	2	3	4	5
c. ...restless or fidgety?	1	2	3	4	5
d. ...so depressed that nothing could cheer you up?	1	2	3	4	5
e. ...that everything was an effort?	1	2	3	4	5
f. ...worthless?	1	2	3	4	5

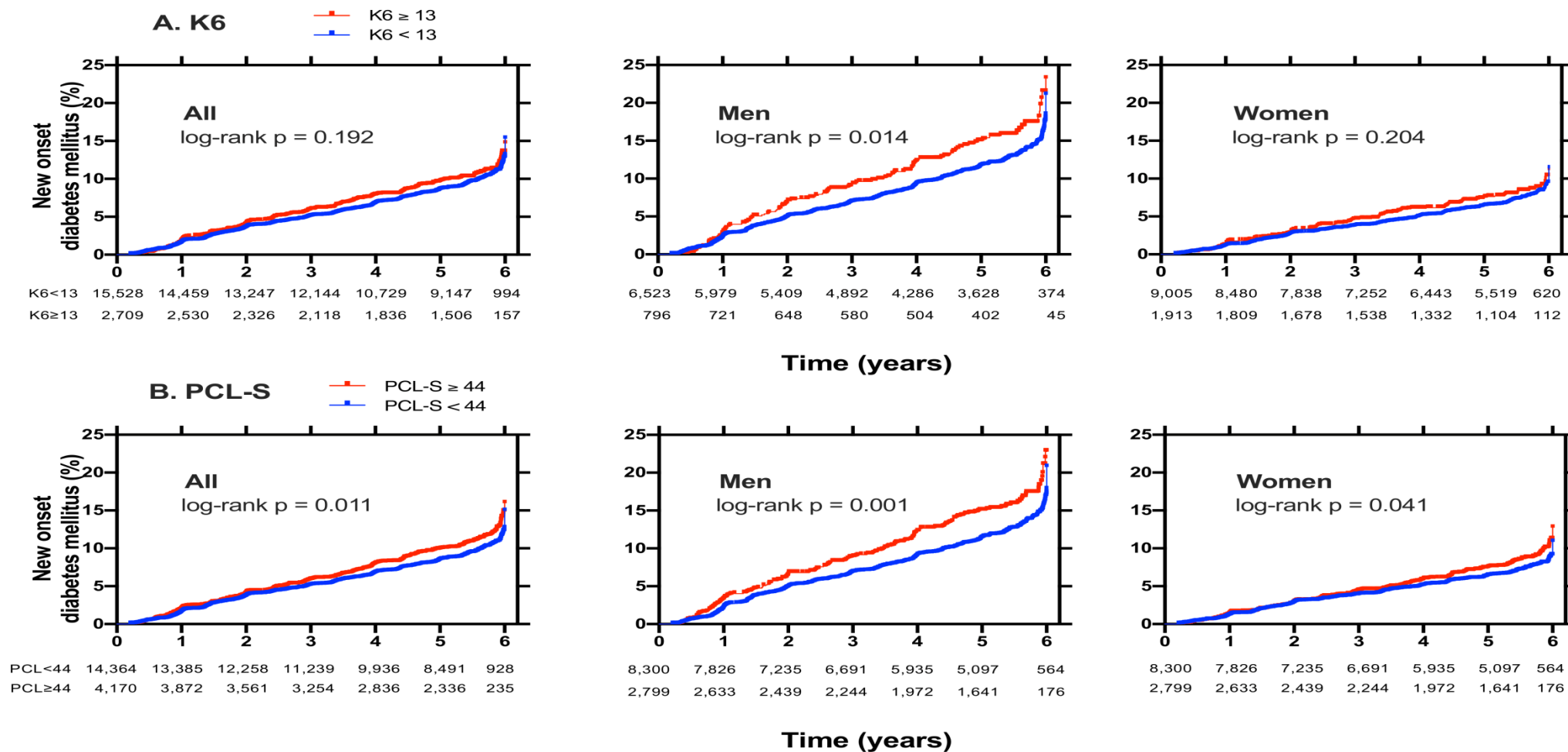
K6: Developed by Kessler et al. in the United States for screening depression and anxiety disorders. Widely used in surveys of the general population as an indicator of the degree of psychological problems, including psychological stress.

Kessler, Arch Gen Psychiatry 2003; 60:184.





# Psychological burden increases new onset diabetes in men



Hirai H, Shimabukuro M et al. Front. Endocrinol. 2022; 13:1008109.

# Topics

## 1. Lessons from 15 years of the CHC\*

\*Comprehensive Health Check

## 2. NCD<sup>†</sup>, evacuation & psychological burden

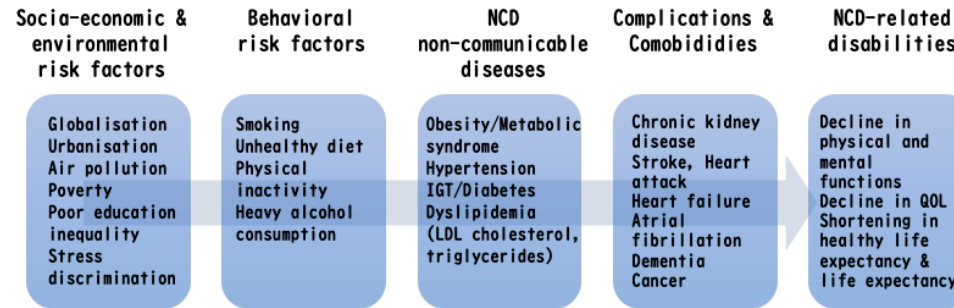
<sup>†</sup>non-communicable diseases = lifestyle-related diseases

## 3. Considering the future from CHC

# NCD : Who it affects and how to prevent it

## How NCD Occurs

NCD: non-communicable diseases



Dans et al, Lancet 2021:377;680  
 Park et al, <https://bit.ly/3HYhWHC>  
 Modified by Shimabukuro

Genetic & Epigenetic risk factors

### Global level

UN, WHO

- Health policy development and implementation
- Supporting NCD research
- Monitoring of NCD
- Support for national and international cooperation

### Country level

government, ministry

- Budget for health promotion system (health screening opportunities)
- Research support
- Develop sustained primary health care system

### Community level

local government, community, workplace, school, non-governmental organization (NPO, NGO)

- Offer healthy food
- Offer places and times for physical activity
- Creating systems to support NCD prevention and care services

### Individual level

individual, family

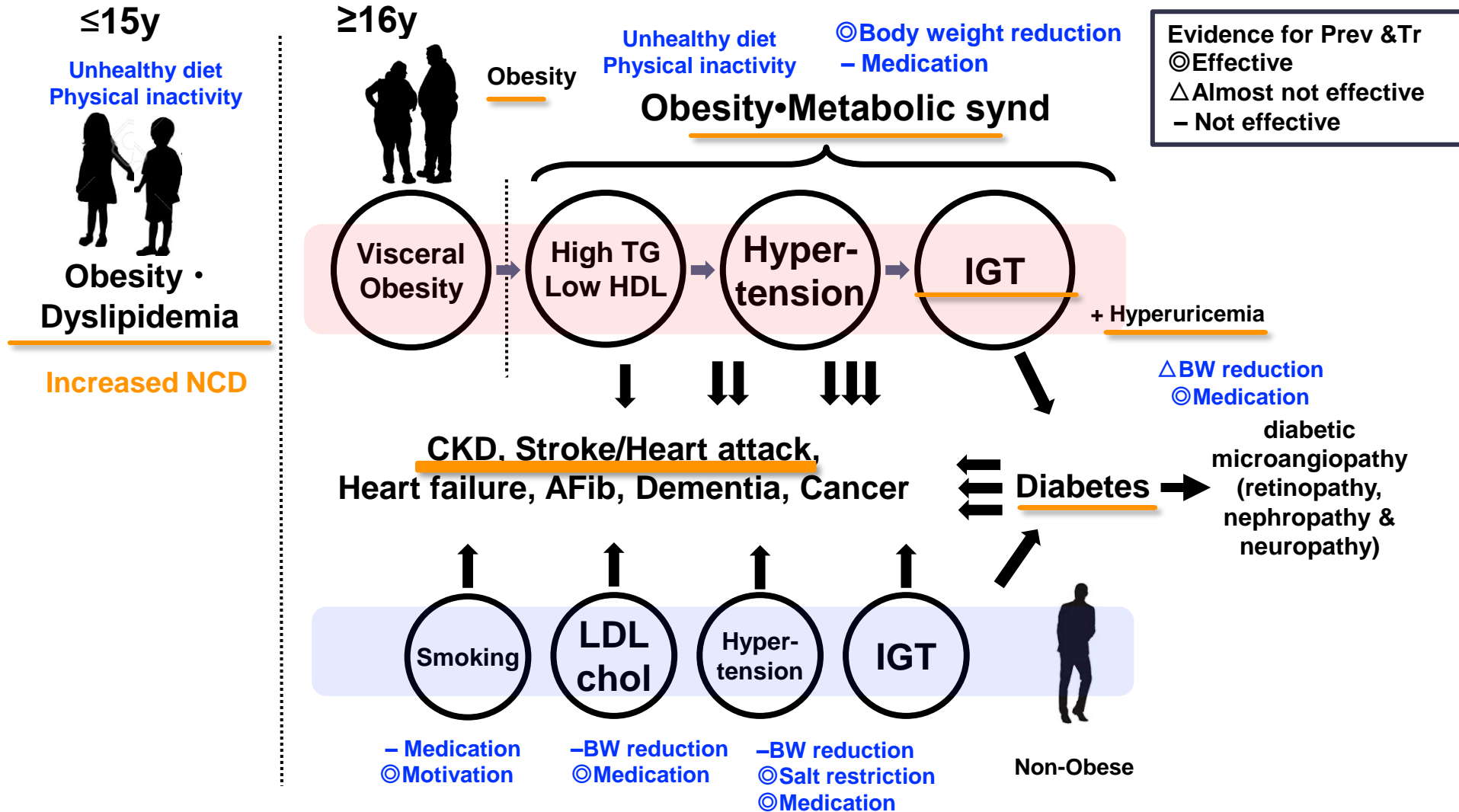
- Healthy lifestyle
- Health literacy

## Role of CHC

Budreviciute et al. Front Public Health 2020:574111 Modified by Shimabukuro (private opinion)

CHC: Comprehensive Health Check

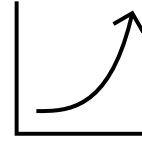
# Increased NCD after the disaster : Evidence for Prevention and Treatment Scientifically proven facts



IGT: impaired glucose tolerance  
CKD: chronic kidney disease  
Afib: atrial fibrillation

# Summary

take home message



## 1. Lessons from 15 years of CHC

- Increased in adults, partially in children: **obesity, metabolic syndrome, IGT & diabetes, chronic kidney disease, hyperuricemia, and polycythemia.**
- Estimated doses were associated with increased NCD→ Presumably, **evacuation and lifestyle changes** may have affected the development of NCD among residents with higher estimated radiation doses.

## 2. NCD, evacuation, and psychological burden

- Psychological burden increases new onset diabetes in men.
- **Evacuation-related changes in lifestyle** habits also affect **lifespan.**

## 3. Considering the future from CHC insights

- Individuals and communities must learn **health literacy** and apply **correct health knowledge** — that is, evidence-based information on unhealthy habits and methods of prevention and treatment.

● このスライドの著作権は、原則として著作者に帰属します。著作権法上認められた場合を除き、その利用には原則として著作者の許諾が必要です。

As a general rule, the copyright of the slides belongs to the author. In principle, the author's authorization is required for their use, except in cases recognized by the copyright law.