

CURRICULUM VITAE

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Wholegrain contribution to health status and impact on non-communicable diseases and current data on wholegrain intake in Indonesian population



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Definition of a Whole Grain:

Whole grains contain all the essential parts and naturally occurring nutrients of the entire grain seed in their original proportions (Whole Grains Council, 2004).

Example:

Corn, oats, brown rice,
sorghum



WHOLE GRAINS

- The whole-grain consists starchy endosperm, germ and bran.



What is a Whole Grain?

Bran

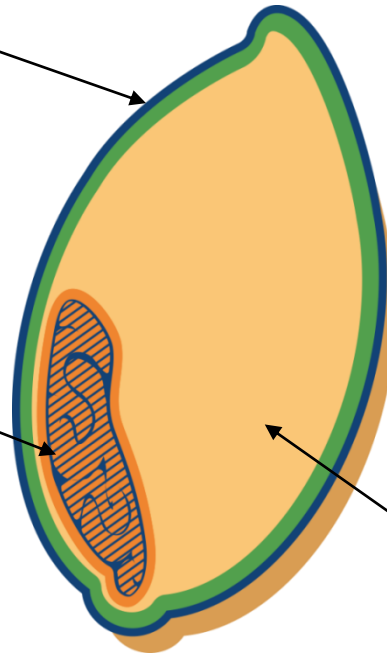
“Outer shell” protects seed

- Fiber
- B Vitamins
- Trace Minerals
- Phytochemicals

Germ

Nutrient storehouse

- B Vitamins
- Vitamin E
- Trace Minerals
- Phytochemicals
- Antioxidants
- Lipids
- Healthy Fats



Endosperm

Provides energy

- Carbohydrate
- Protein
- Some B Vitamins

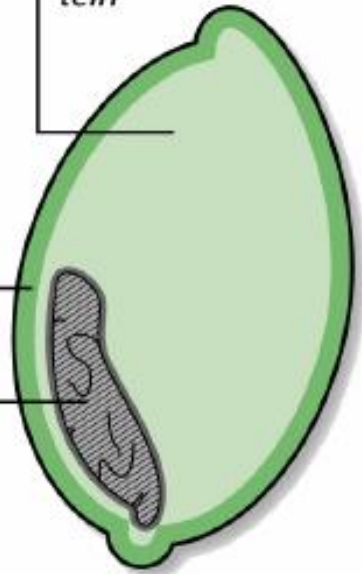
Whole grain kernel

Bran

"Outer shell" protects seed
Fiber, B vitamins, trace minerals

Endosperm

Provides energy
Carbohydrates, protein

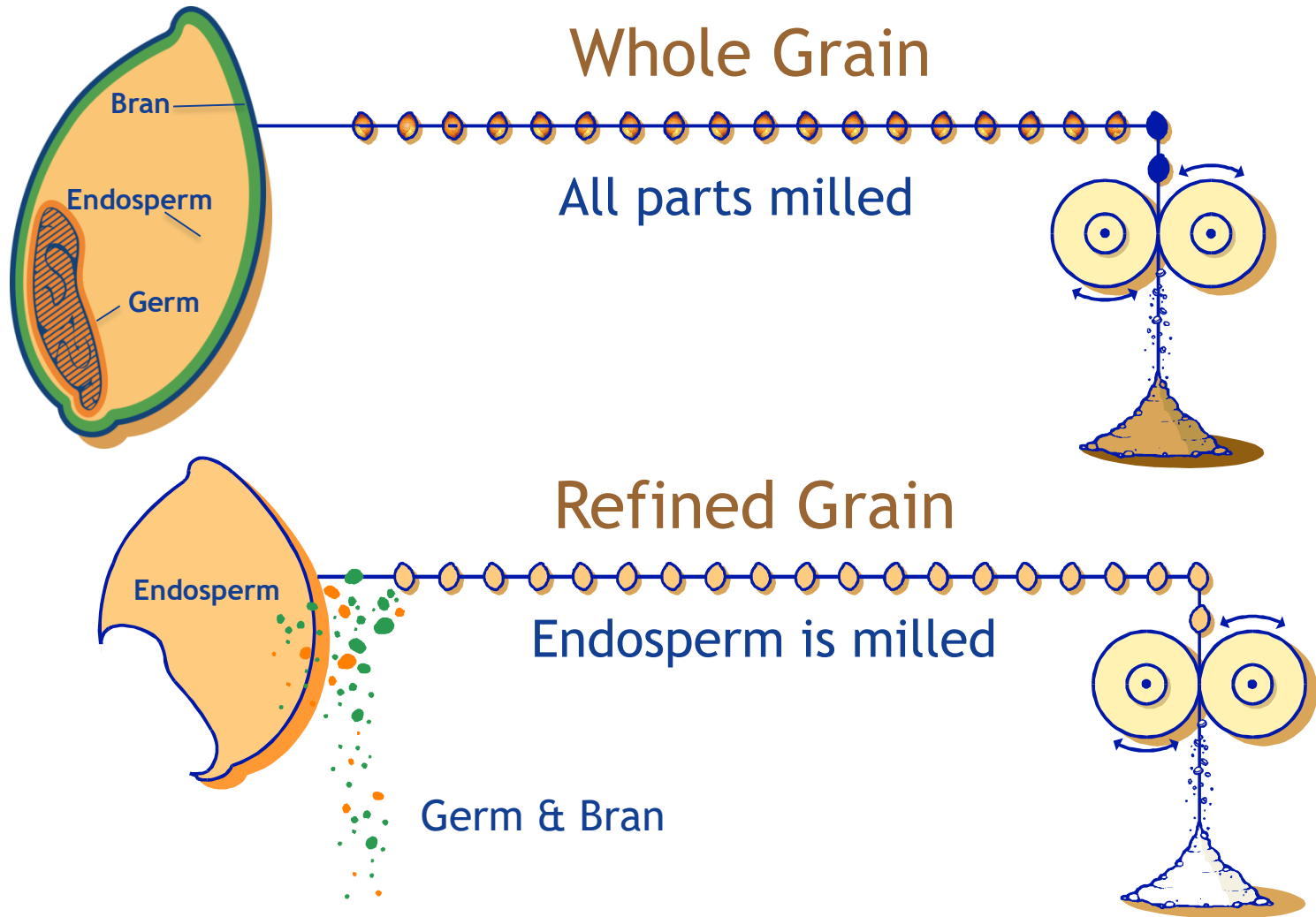


Germ

Nourishment for the seed
Antioxidants, vitamin E, B-vitamins

- Refined Grain: grains that are not whole because they are missing one or more of the key parts
 - White flour and white rice (bran and germ removed)

Milling of Grains



What is ancient grain?

- Grains that are largely unchanged over the last several hundred years.
- Example: sorghum, quinoa, black rice, black barley.
- Modern wheat is not an ancient grain (constantly bred and changed)



❑ What is the difference between whole wheat and whole grain?

The answer in another question:

❑ What is the difference between carrots and vegetables?



Which grain is “healthiest”?

Each grain has its own little specialties:

- Oats are high in manganese (formation of bone)
- Durum wheat has more selenium (prevent cellular damage from free radicals)
- Barley is highest in fiber
- Quinoa rich in folate



Common Types Of Whole Grains

Unpolished
(Brown) rice



Whole
wheat



Oats



Corn



Rye



Buckwheat



Dehulled
barley
(not pearled
barley)



brown rice

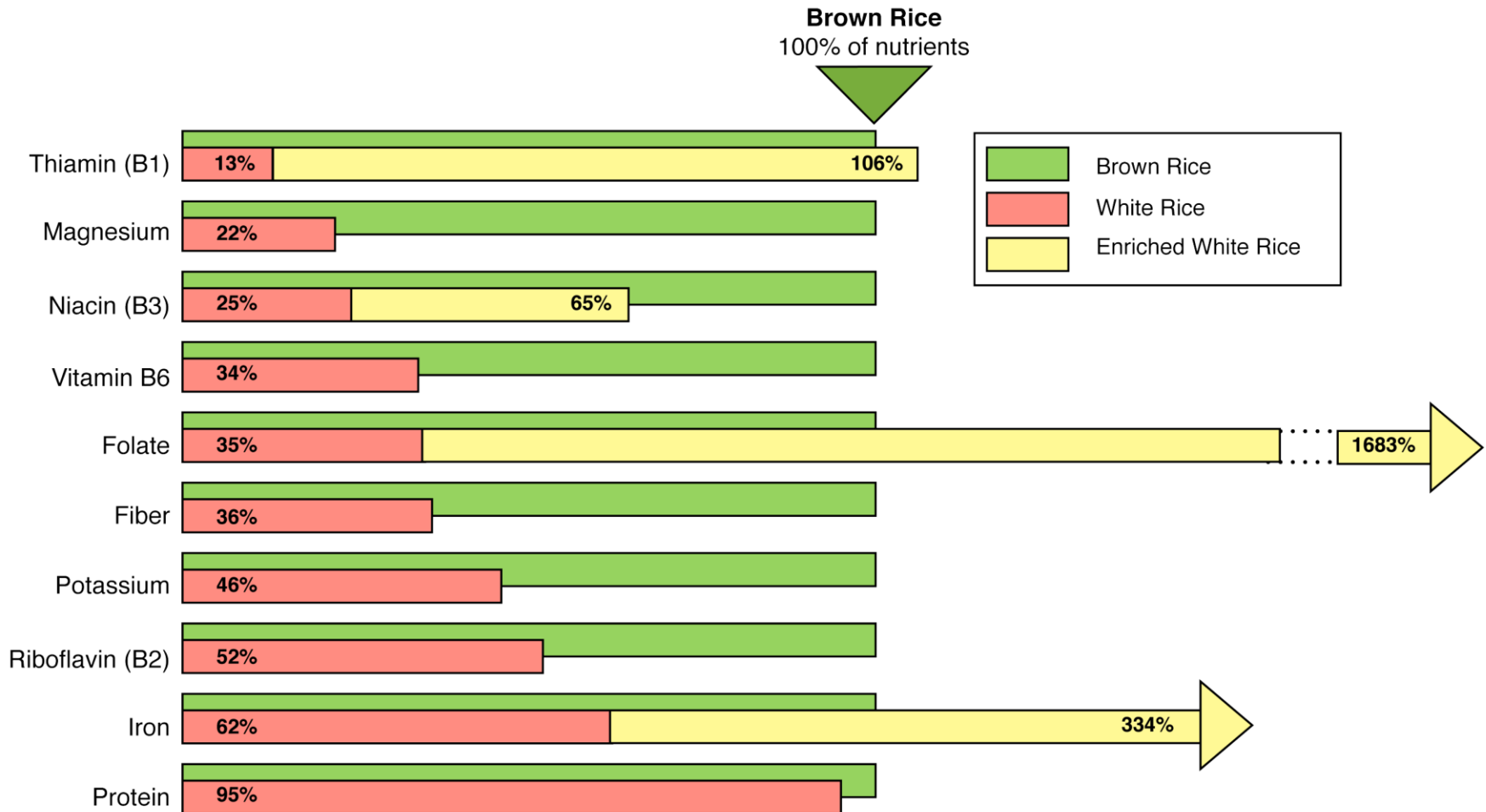


vs

white rice

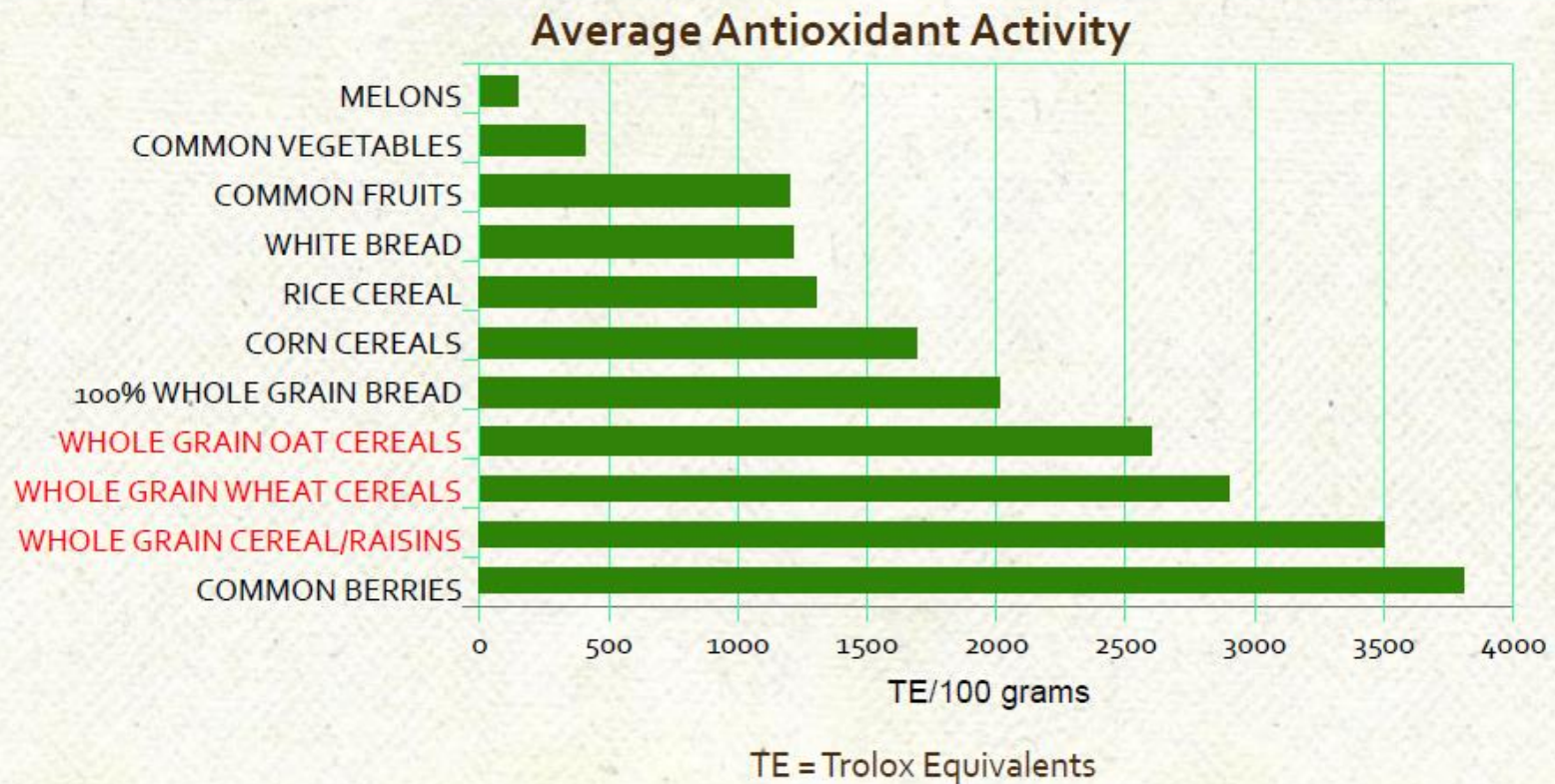


White Rice vs Brown Rice vs Enriched White Rice





WHOLE GRAINS ARE RICH IN ANTIOXIDANTS



Source: Miller 2000

Whole grains products in Indonesia

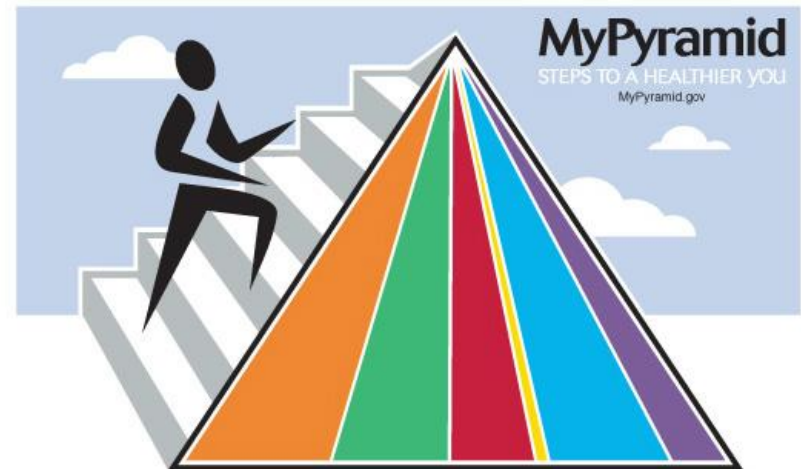




HEALTH GROUPS RECOMMEND WHOLE GRAINS

In the US, the 2010 Dietary Guidelines recommend:

- 3 slices of whole grains bread or 3 servings of breakfast cereal
- Consumption lags: the average American eats less than 1 daily serving of whole grains



GRAINS Make half your grains whole	VEGETABLES Vary your veggies	FRUITS Focus on fruits	MILK Get your calcium-rich foods	MEAT & BEANS Go lean with protein
Eat at least 3 oz. of whole-grain cereals, breads, crackers, rice, or pasta every day. 1 oz. is about 1 slice of bread, about 1 cup of breakfast cereal, or 1/2 cup of cooked rice, cereal, or pasta.	Eat more dark-green veggies like broccoli, spinach, and other dark leafy greens. Eat more orange vegetables like carrots and sweet potatoes. Eat more dry beans and peas like pinto beans, kidney beans, and lentils.	Eat a variety of fruit. Choose fresh, frozen, canned, or dried fruit. Go easy on fruit juices.	Go low-fat or fat-free when you choose milk, yogurt, and other milk products. If you don't or can't consume milk, choose lactose-free products or other calcium sources such as fortified foods and beverages.	Choose low-fat or lean meats and poultry. Bake it, broil it, or grill it. Vary your protein routine—choose more fish, beans, peas, nuts, and seeds.

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(US) American Heart Association

“Eat more **whole-grain foods**. Like fruits and vegetables, whole-grain foods are low in fat and high in fiber”

(US) American Cancer Society

“Choose **whole grains** in preference to processed (refined) grains and sugars”

(US) American Diabetes Association

“Foods containing carbohydrate from **whole grains**, fruits, vegetables, and low-fat milk should be included in a healthy diet”



(EU) European guidelines on cardiovascular disease prevention in clinical practice

“The consumption of the following foods should be encouraged: fruits and vegetables, **whole grain cereals and bread**, low fat dairy products, fish, and lean meat.”



Australia – The Australian Guide to Healthy Eating

- Enjoy grain (cereal) foods, mostly **whole grain** and/or high cereal fiber varieties.



Canada – Canada's Food Guide

- Make at least half of your grain products **whole grain** each day.



Denmark – Report of the National Food Institute

- Recommended, overall, that Danes consume a minimum of 75g of **whole grains** daily.



Oman – Eat Your Way to a Healthier Day

- It is advised to consume at least a third of daily consumption of cereals from **whole grain** bread and foods that contain whole grains.

Singapore Dietary Guidelines

- All you have to do is replace your refined items with **whole-grain** items.



What are the health benefits?

- Eating whole grains instead of refined grains lowers the risk of chronic diseases
- Benefits are greatest with at least 3 servings daily, other studies show reduce risks from as little as one serving daily.
- The message: every whole grains in your diet helps!



The main benefits of whole grains ¹

The benefits of whole grains most documented by repeated studies include:

- reduced risk of stroke
- reduced risk of type 2 diabetes
- better weight maintenance





Other benefits indicated by recent studies include:

- lower risk of colorectal cancer
- healthier blood pressure levels
- reduced risk of heart disease

Some Clinical Trials

Cooper *et al.*, *Nutrients*, 9 (2), 2017

- 46 subjects were given adequate serving of either WG or RG products, 6 weeks.
- Significant decreases in total cholesterol and LDL were seen after the whole grain treatments but were not observed in the refined grains treatment.

Some Clinical Trials



Kirwan *et al.*, *J Nutr*, 146(11), 2016

- 40 overweight/obese men and women, given 50g/1000 kcal diet WG or RG, 8 weeks.
- Decreases in diastolic blood pressure (DBP) were -5.8 mmHg after the WG diet and -1.6 mmHg after the RG diet ($P=0.01$).

Some Clinical Trials

Sereni *et al.*, Int J Food Science, 68 (1), 2017

- 45 healthy subjects, 1st intervention received bread made from the ancient wheat variety “Verna”, 2nd intervention consumed the modern wheat variety “Blasco”, 8 weeks.
- Blood glucose, total and LDL cholesterol significantly decreased (1st intervention), and no significant differences in the biochemical parameters during the 2nd intervention.



Some Clinical Trials

Santaliestra-Pasias *et al.*, Int J Food Sci Nutr, 67 (5), 2015

- 11 university students, whole grain bread, two testing days.
- The consumption of whole grain bread increased satiety perception and decreased the remaining energy intake during the testing day.



Some Clinical Trials

Kazemzadeh *et al.*, Int J Prev Med, 5 (4), 2014

- 40 overweight/obese women, 150 g cooked brown rice or white rice, 6 weeks.
- Brown rice in comparison with white rice diet significantly reduced weight, waist and hip circumference, BMI and diastole blood pressure.





HOW MUCH IS ENOUGH?

How much whole grain should you be eating? And what foods can help you enjoy healthy levels of whole grain consumption?

Is there a global dietary guideline with quantitative whole grains?



Unfortunately there isn't one yet.

The US recommends 48 g/day = 3 servings per day, while in Denmark the recommendation goes up to 75g/10mJ of energy

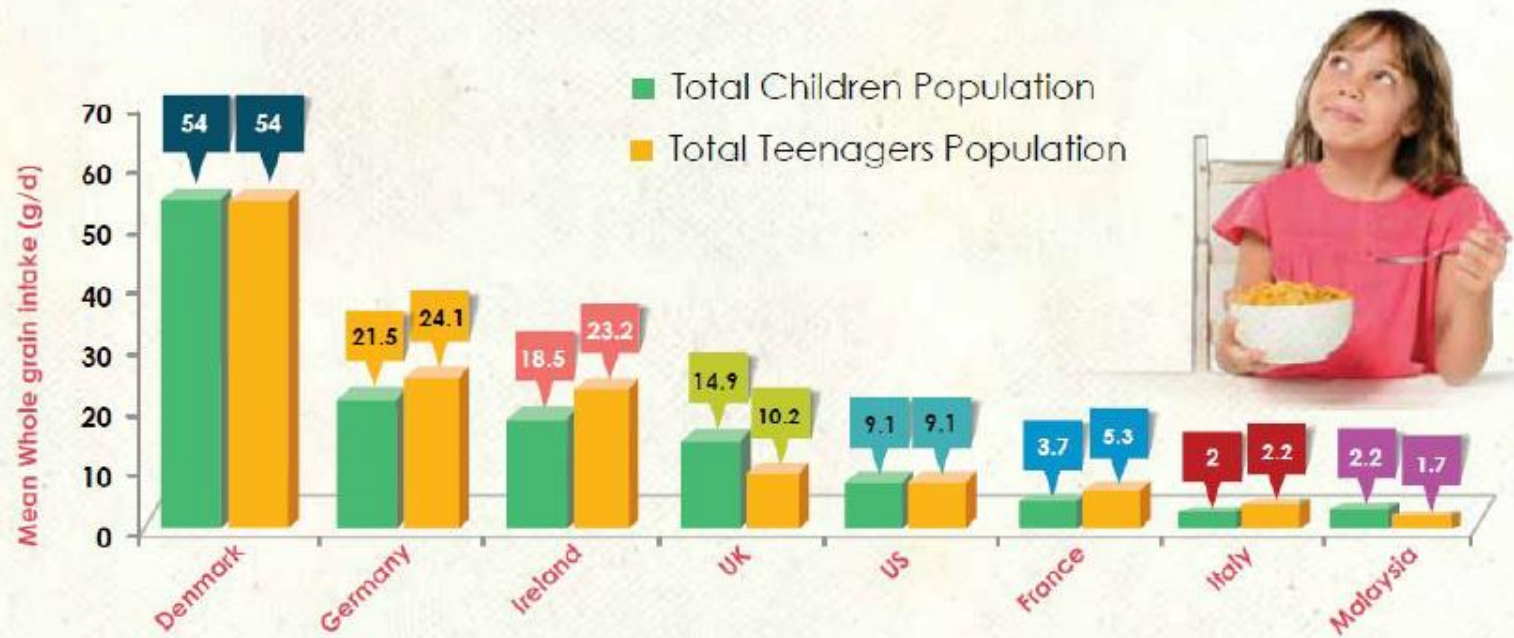


**World Health
Organization**

Recommends increasing whole grain intake as a strategy to reduce obesity, cardiovascular disease and diabetes.

Worldwide , Whole Grain consumption can not meet the recommendations in majority of the populations

Global Overview of Whole Grain Intakes (g/d) in Children & Teenagers





Degenerative Diseases and Whole Grains Consumption in Indonesia

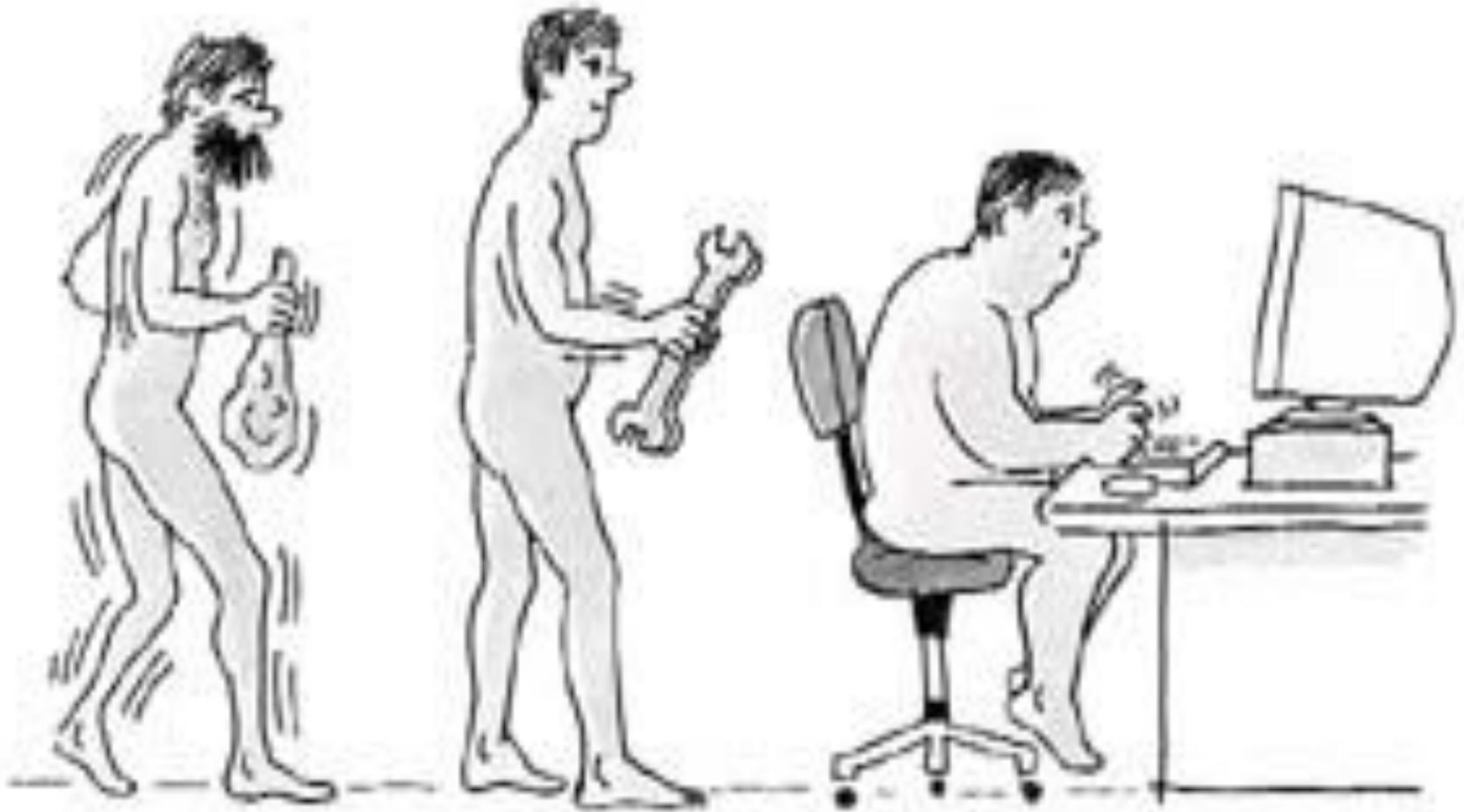
Obesity is a world-wide problem, affecting not only affluent developed countries like the US and most European countries but also affecting less affluent developing countries like Indonesia.

WHO and the International Obesity Task Force (IOTF) have declared obesity as an epidemic on a global scale (Taubes, 1998).

Taubes G. 1998. As Obesity Rates Rise, Experts Struggle to Explain Why. *Science*. 1998 May; 280(5368): 1367-8



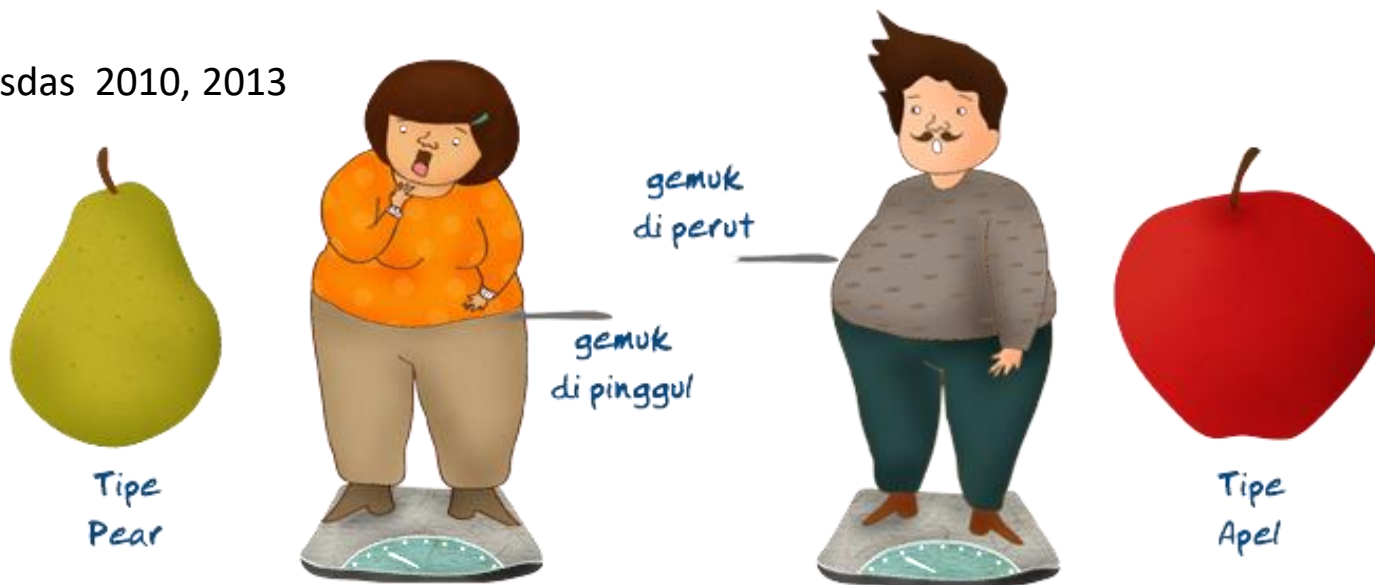
Job Evolution



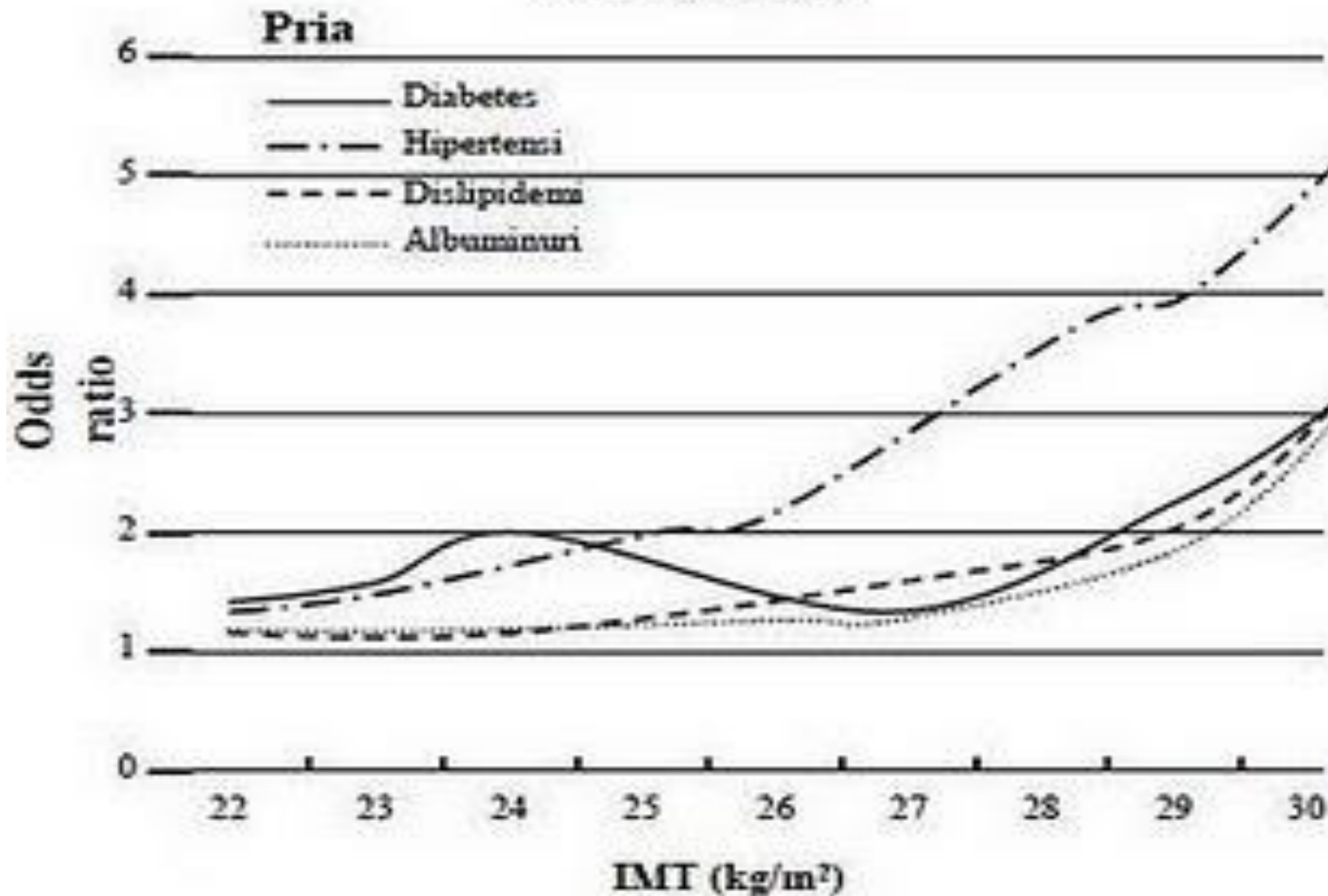
Overweight and Obesity in Indonesia

Sex	2010	2013
Man (%)	7.8	19.7
Woman (%)	15.5	32.9

Source: Riskesdas 2010, 2013

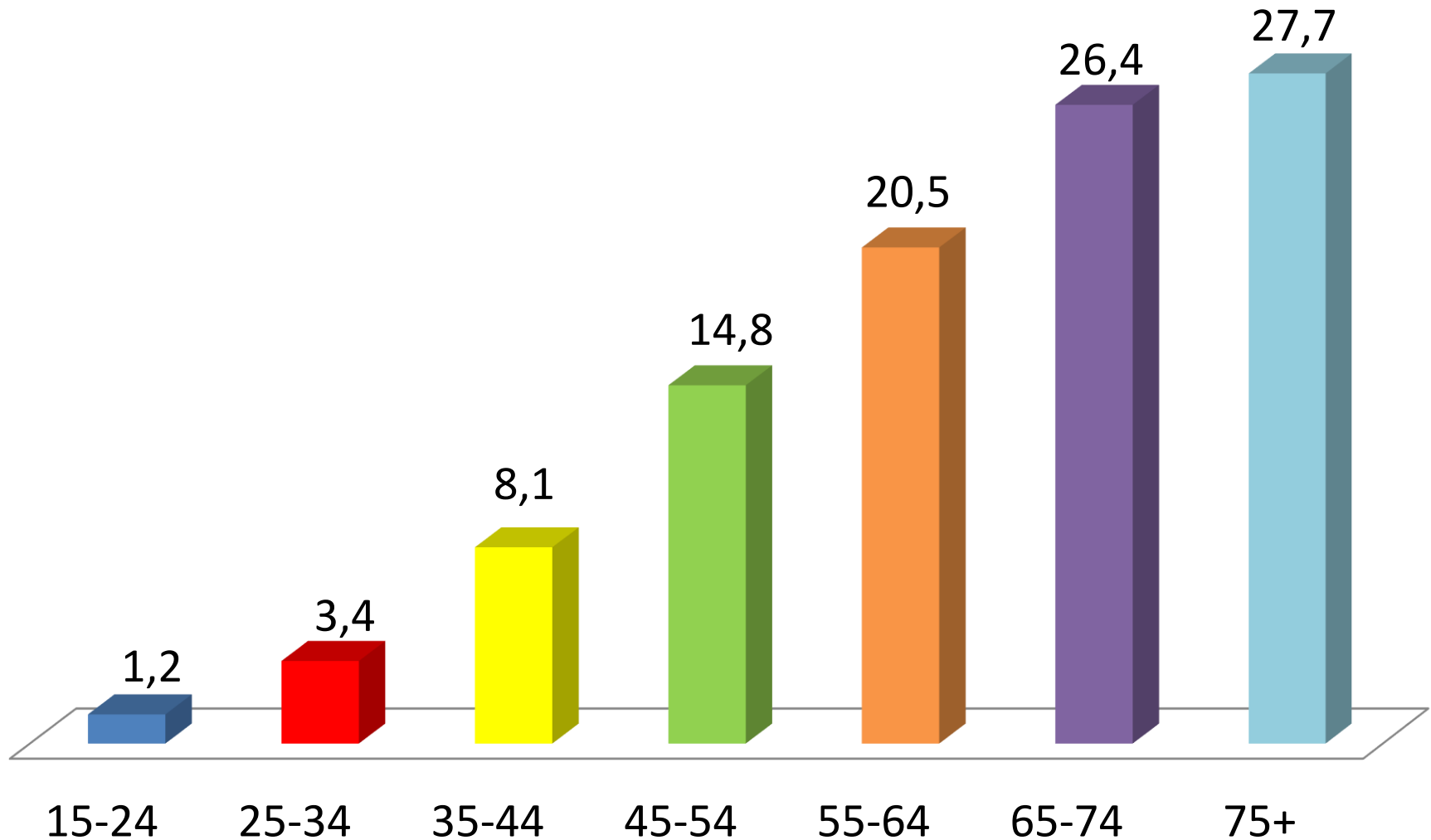


OBESITAS



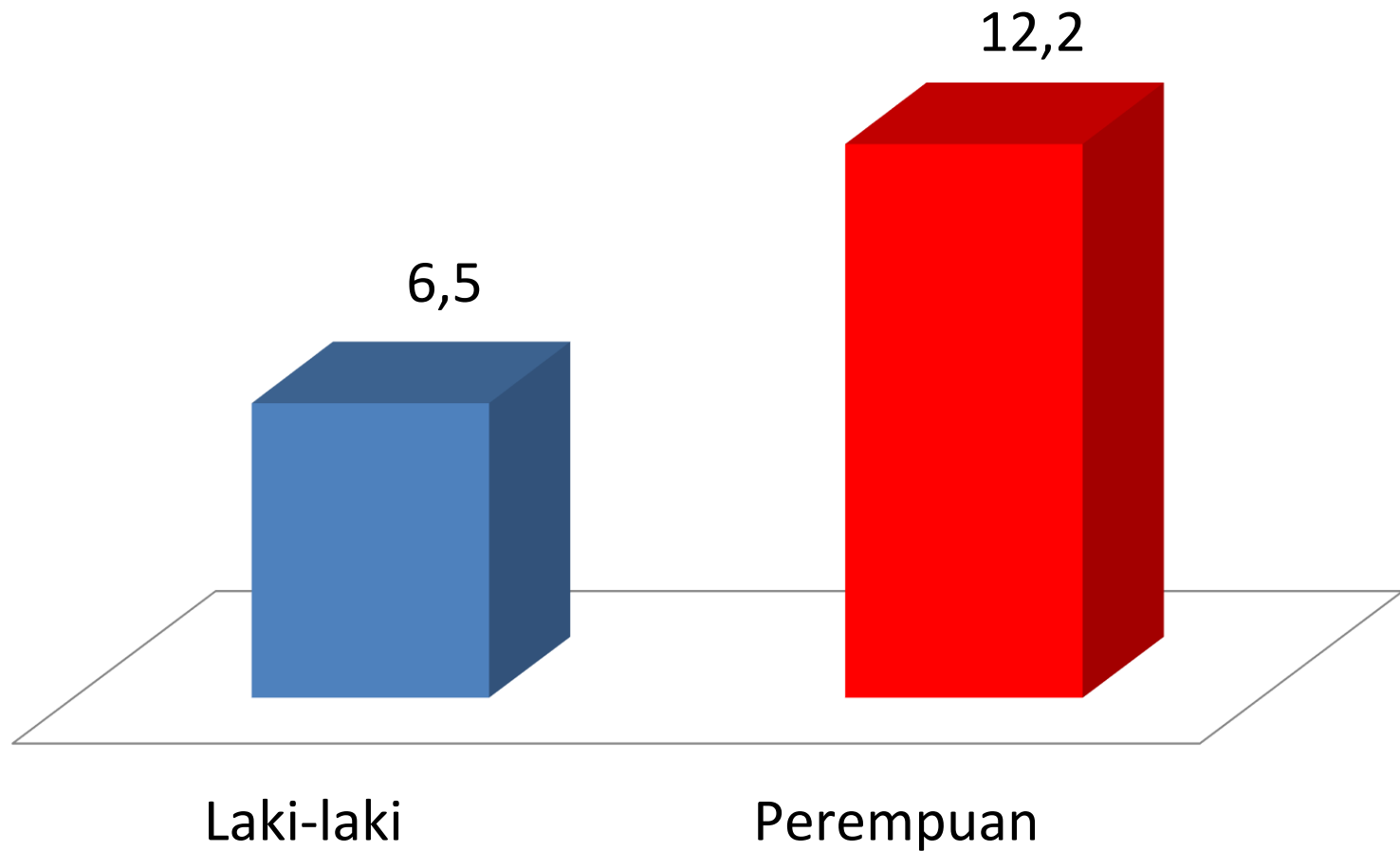
Ko GTC, Chan JCN, Woo J, Lau E, Yeung VTF, Chow C-C, Wai HPS, Li YKS, So W-Y, Cockram CS. Simple anthropometric indexes and cardiovascular risk factors in Chinese. *Int J Obes* 1997; 21: 995-1001

Prevalence (%) of Hypertension in Indonesia based on Age



Source: Kemenkes RI. 2013. Riset Kesehatan Dasar 2013. Jakarta: Kemenkes.

Prevalence (%) of Hypertension based on Sex



Rice and Whole Grain (CORN) Consumption in Indonesia (Total Diet Survey 2014)

Age	Rice	Corn and Its Products
0-59 mo	78.1	1.7
5-12 yo	158.8	3.4
13-18 yo	187.5	4.1
19-55 yo	215.2	4.3
>55 yo	189.7	4.6
Average	197.1	4.1

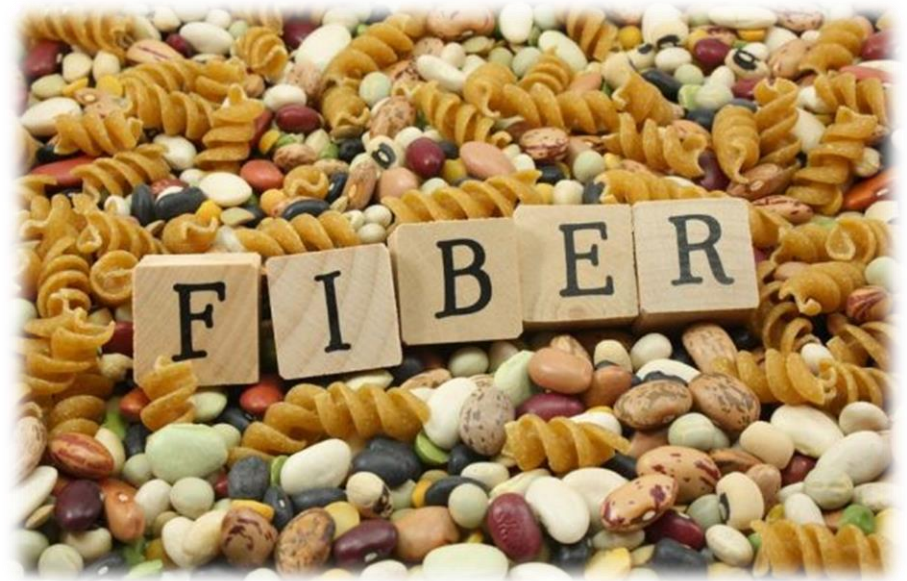
Whole grain (corn) consumption was only 4.1 g;
Rice contributes about 80% of total cereals

Whole Grain (Corn) Consumption in Sulawesi, 2017

PROVINCE	g/capita/day
Gorontalo	15.9
Sulawesi Tengah	4.1
Sulawesi Tenggara	3.9
Sulawesi Utara	3.9
Sulawesi Selatan	3.6
Sulawesi Barat	1.6

Sumber: Badan Pusat Statistik, 2017 (Data diolah)

- Eating wholegrain foods is a good way of making sure you get enough fiber.



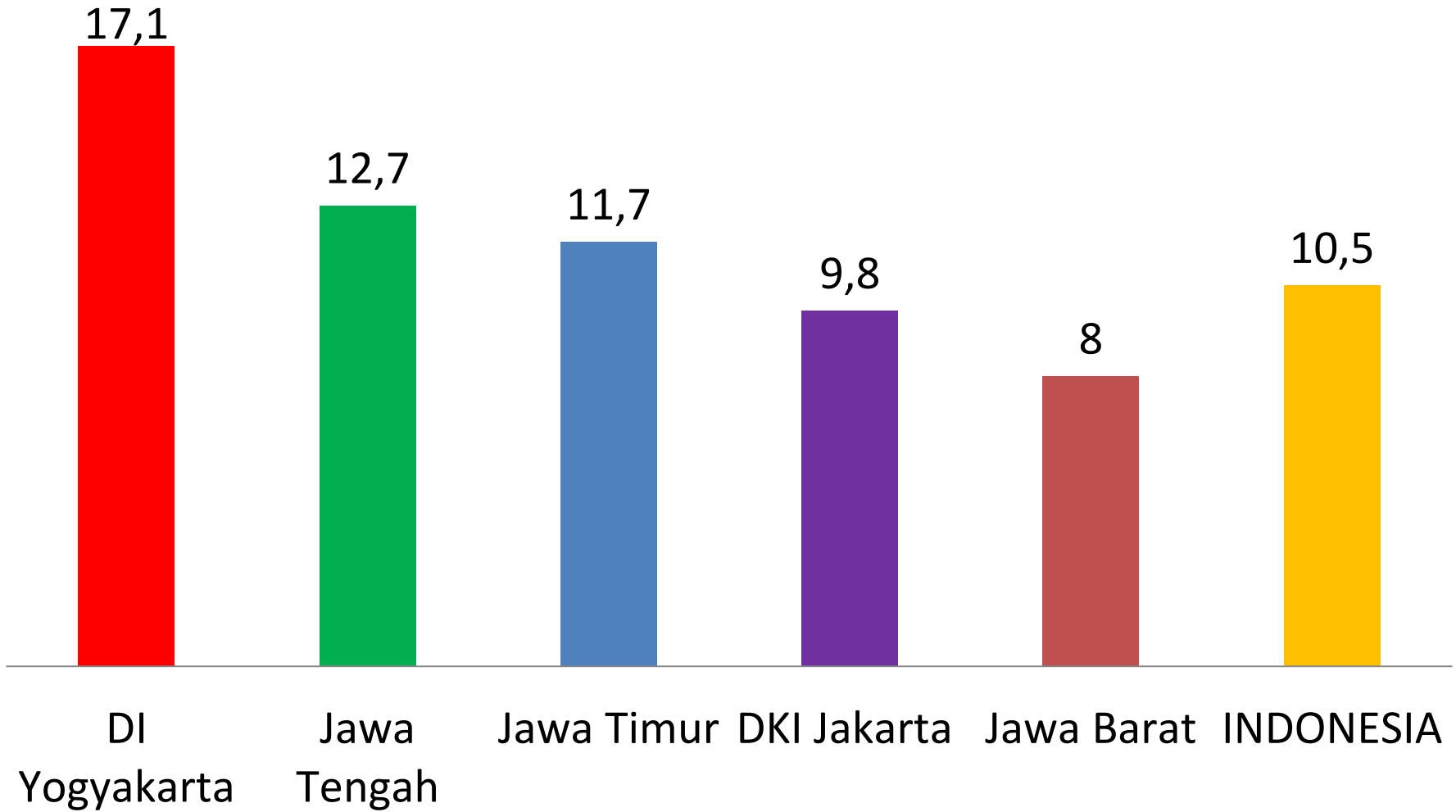
Look for
grains that are
100%!

Fiber needs
water to work.

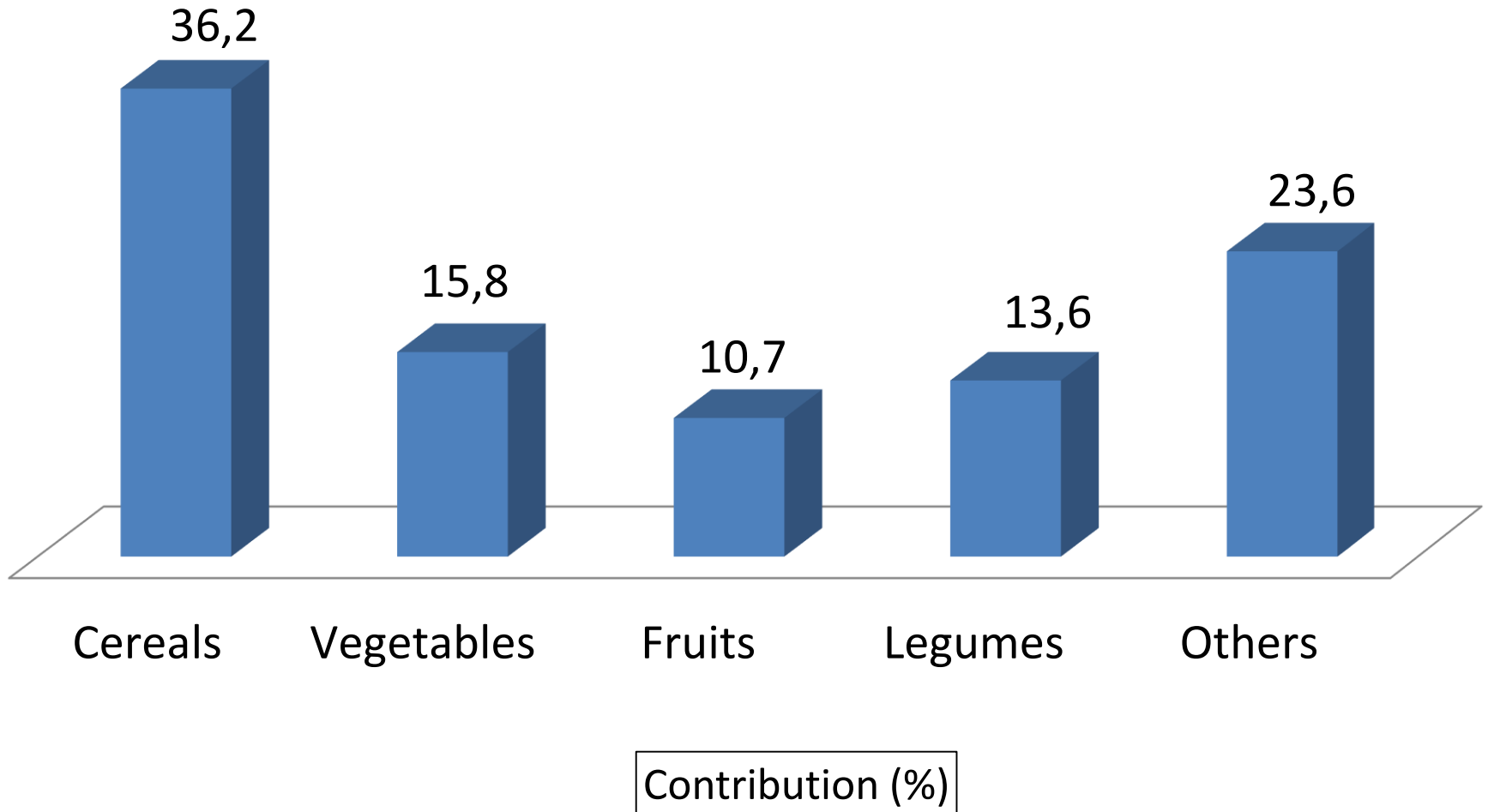
Eat at least two
100% whole-
wheat food today.

Steps to Success

FIBER INTAKE (g/capita/day)



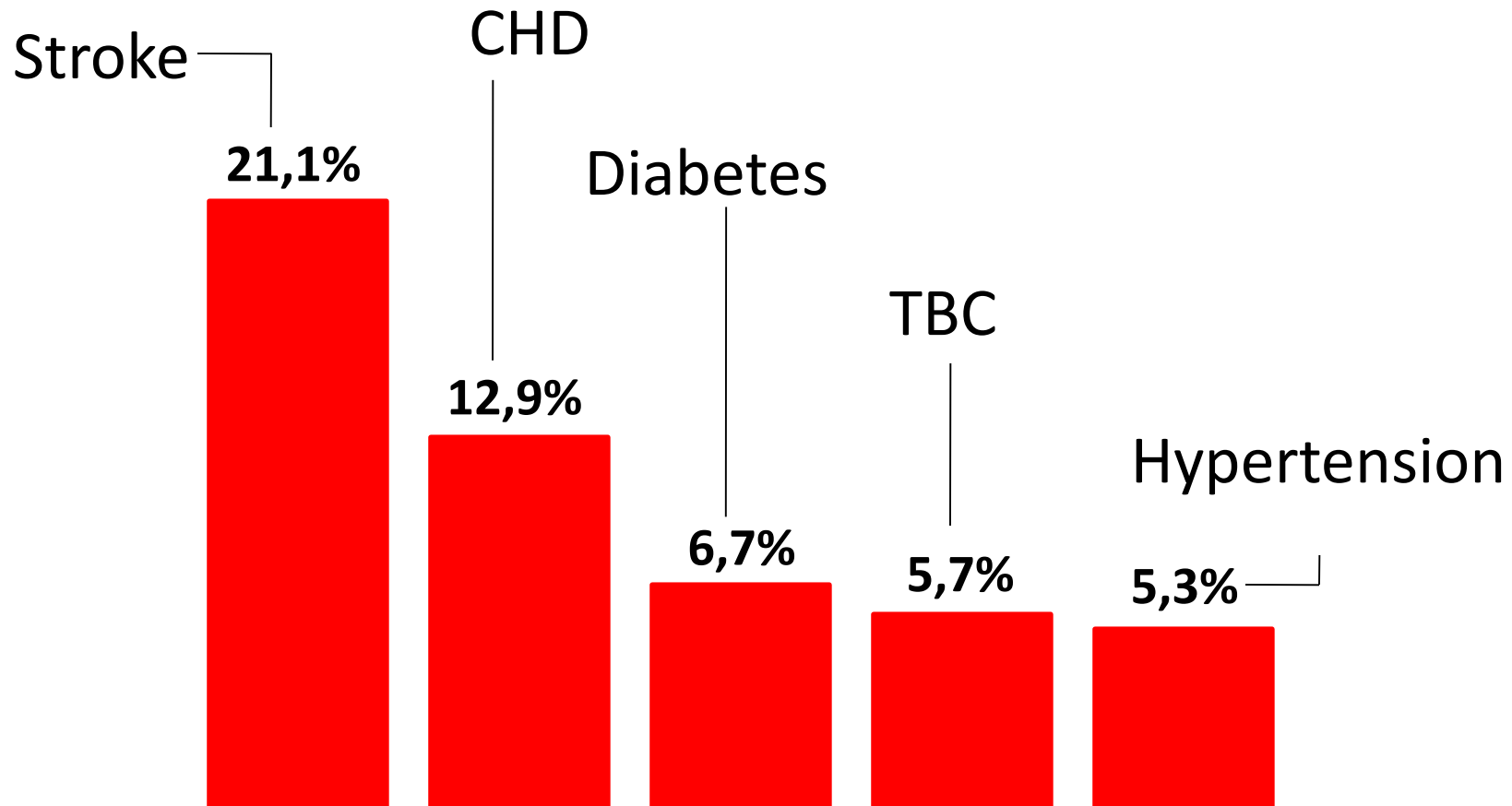
FOOD SOURCES OF FIBER INTAKE



Source: Jahari, Year 2001

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THE HIGHEST DEATH CAUSES IN INDONESIA 2014



Keterangan: Data dari 41.590 kematian di Indonesia, Januari – Desember 2014

Sumber: Litbang “Kompas”/BIP, dari Badan Penelitian dan Pengembangan Kesehatan (Balitbangkes) Kementerian Kesehatan



Whole Grains Becomes Important

- Indonesia, as a nation with high cereals consumption, should include whole grains in the daily diet to promote community nutrition and health status.
- Nutrition awareness campaign is needed to overcome not only stunting, but also non-communicable diseases by including healthy foods (whole grains) in the nutrition and health promotion.

Conclusion and Recommendation

- Consumption of whole grains plays an important role and helps to decrease the risk of degenerative diseases.
- Health promotion to prevent degenerative diseases needs synergy of governmental health sectors-industries-and public health nutrition scientists.



THANK you

