The dynamics and temporal trends of energy and available macronutrients in Nepal: a joinpoint regression analysis of Food Balance Sheet data from 1961 to 2013

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Outline of the Presentation:

- Background of the study
- Methods
- Results Section
- Limitations
- Conclusions

Background of the study

Collecting Food

Age of Famine

Receding Famine

Degenerative Disease

Behavioral Change

Popul Dev Rev. 1993; 19: 138-157

The temporal changes in dietary history have quickened over the last three centuries, which can be linked to the high level of **diet-related non-communicable diseases** (DR-NCDs).

Popul Dev Rev. 1993; 19: 138-157

About 8 in 1000 people died in the World in 2016

7 out of 10 deaths occurred due to the NCDs

World Health Statistics (2018) pp.5-6

In 2002, the National Academy of Medicine (NAM) developed **acceptable macronutrient distribution ranges (AMDRs)** and set forth an evidence-based range.

J. Am. Diet. Assoc. 2002;102:1621–30

These evidence-based ranges were designed to **ensure an adequate intake** of nutrients and address the **relationship of macro-nutrients and DR-NCDs**.

Clin. Exp. Hypertens. 2015;37:463–7

To analyze the **dynamics and temporal trends** in apparent energy and macronutrient intakes in the Nepalese diet **from 1961 to 2013**

Methodology

Due to the **lack of long-term national** dietary intake dataset, food availability data in Nepal from 1961 to 2013 were obtained from the **FAOSTAT database**

Food and Agriculture organization. FAOSTAT. 2018

The **Atwater coefficients** were used to calculate the available energy from the macronutrients. The percentage of the energy contribution from each of the macronutrients were then calculated.

US Official Experiment Stations, Bulletin No. 28. 1896

To analyze the temporal trends and to identify significant changes in trends, we performed **joinpoint regression analysis**.

Straight line segments are joined at "**joinpoints**" where energy and macronutrient intake changes its slope statistically significantly. To describe linear trends by period, the estimated **annual percent change (APC)** is then computed for each of those trends.

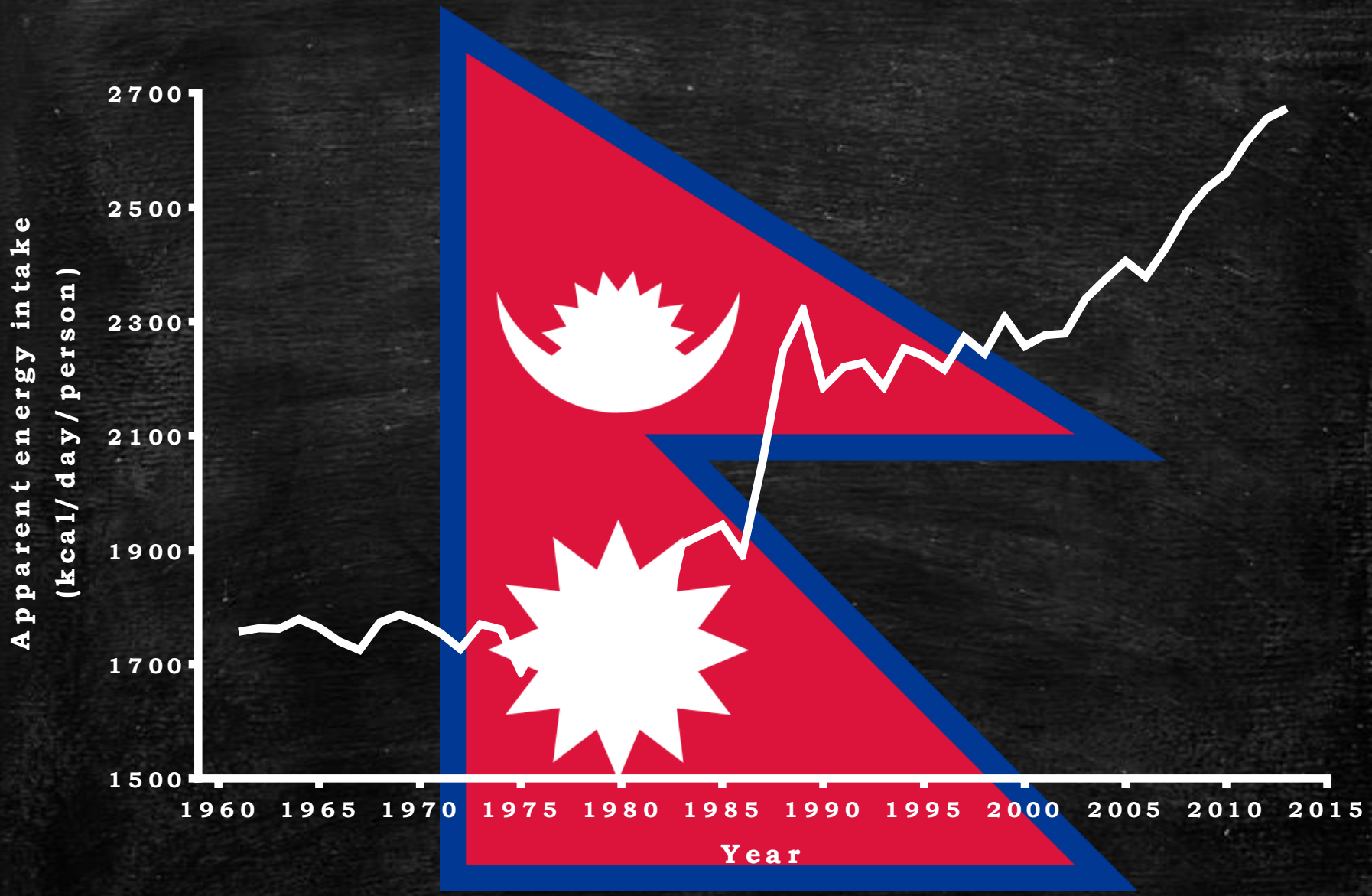
Stat. Med. 2000;19:335–51

Results Section

Table 1. Energy and percent macronutrient distribution in the apparent diet from 1961 to 2013

	1961	2013	% change	AAPC[1]
Energy	1757	2673	52.1	0.8
Energy contribution				
Carbohydrate	76.4	71.5	-6.4	-0.1
Protein	10.4	10.3	1.0	0.0
Fat	13.3	18.1	36.1	0.6

[1]AAPC is the average annual percentage change in energy and macronutrient distribution in the diet, calculated as a geometric weighted average of the calculated APCs of various segments from 1961 to 2013


Apparent energy intake
(kcal/day/person)
2700
2500
2300
2100
1900
1700
1500
1960 1965 1970 1975 1980 1985 1990 1995 2000 2005 2010 2015
Year

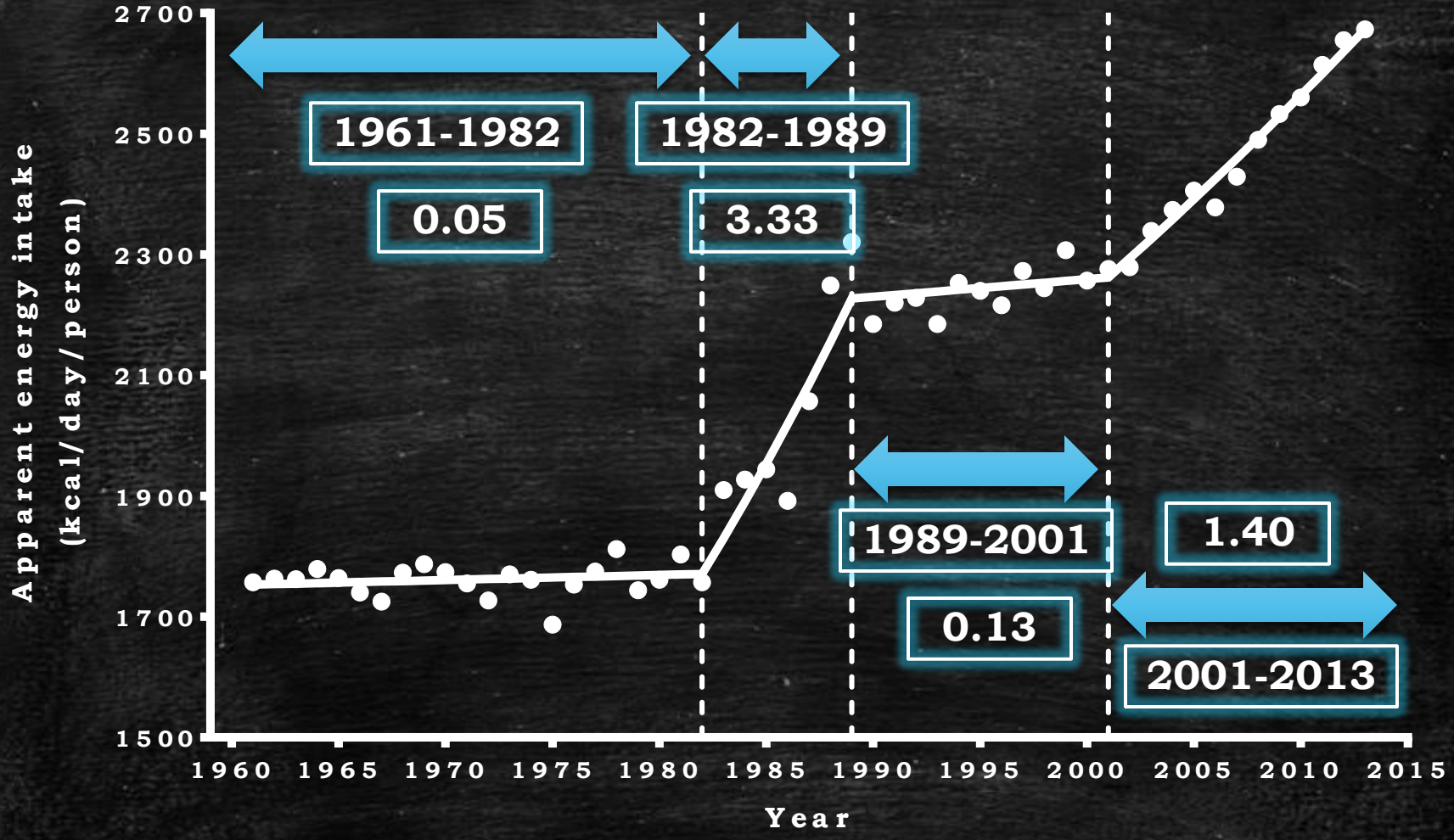


Figure 1. Trends in apparent energy intake in Nepalese diet. The vertical line represents the joinpoits and the values in the boxes represents the trends duration and the annual percentage change

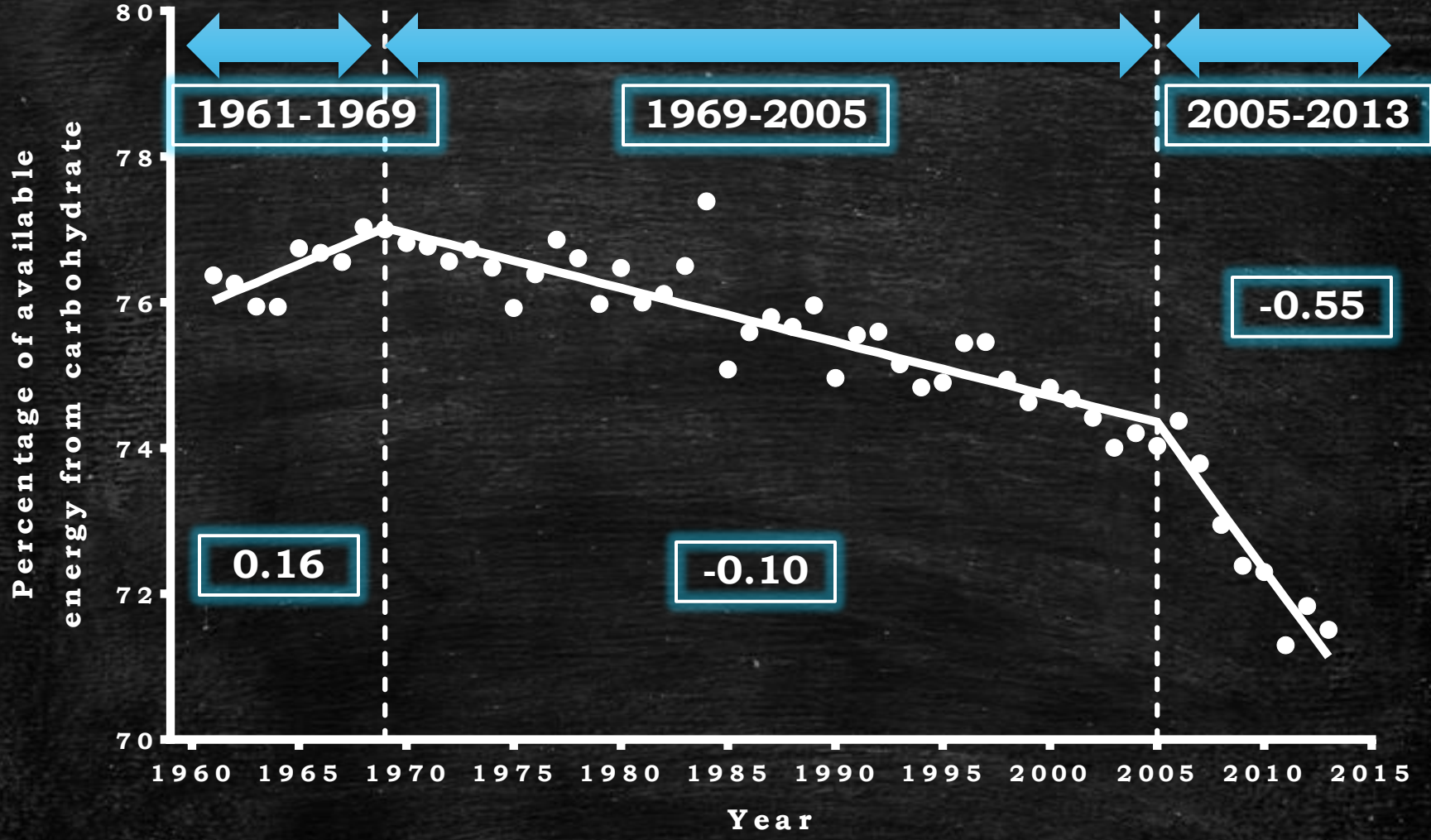


Figure 2. Trends in apparent carbohydrate energy in Nepalese diet. The vertical line represents the joinpoits and the values in the boxes represents the trends duration and the annual percentage change

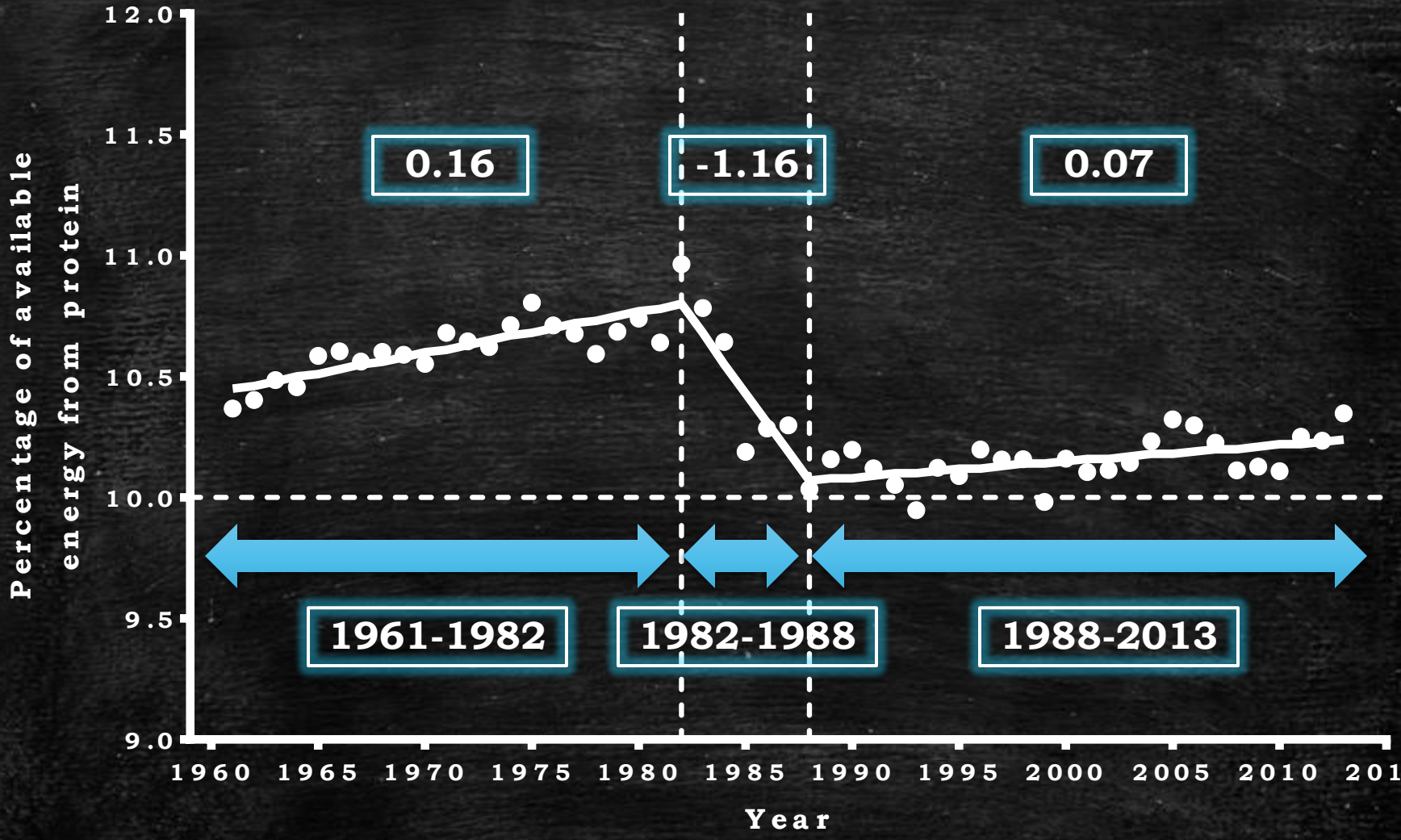


Figure 3. Trends in apparent protein energy in Nepalese diet. The vertical line represents the joinpoits and the horizontal line represents the recommendation based on the AMDR for protein

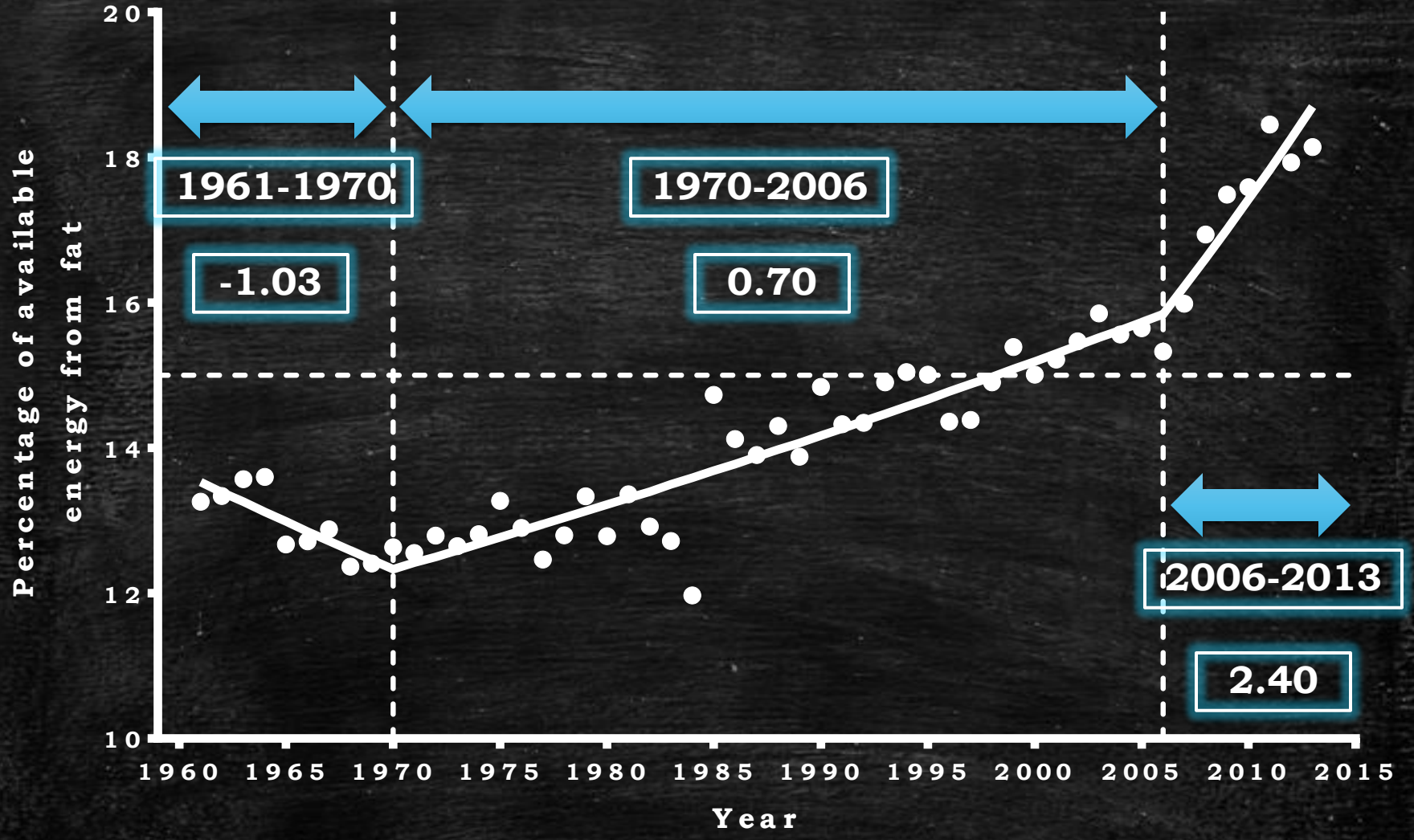


Figure 4. Trends in apparent fat energy in Nepalese diet. The vertical line represents the joinpoits and the horizontal line represents the recommendation based on the AMDR for fat

Limitations

We need to be very conscious to explain the significant changes in the temporal trends. The methodological and analytical changes through out the time period might affect the temporal trends in certain extent.

Food balance sheet overestimate food consumption and nutrients intake and food are listed as basic commodities. Moreover, certain categories have lack of details.

Conclusion

Energy availability increased by 52.1%. The availability of carbohydrate energy though decreased in the Nepalese diet but still higher while available protein, especially from animal sources was inadequate in the diet for the last 53 years

During the 1980s (1982-1988) there was a marked shift in the availability of protein and fat in the diet and was characterized by increased plant origin fat and protein and reduced animal origin fat and protein

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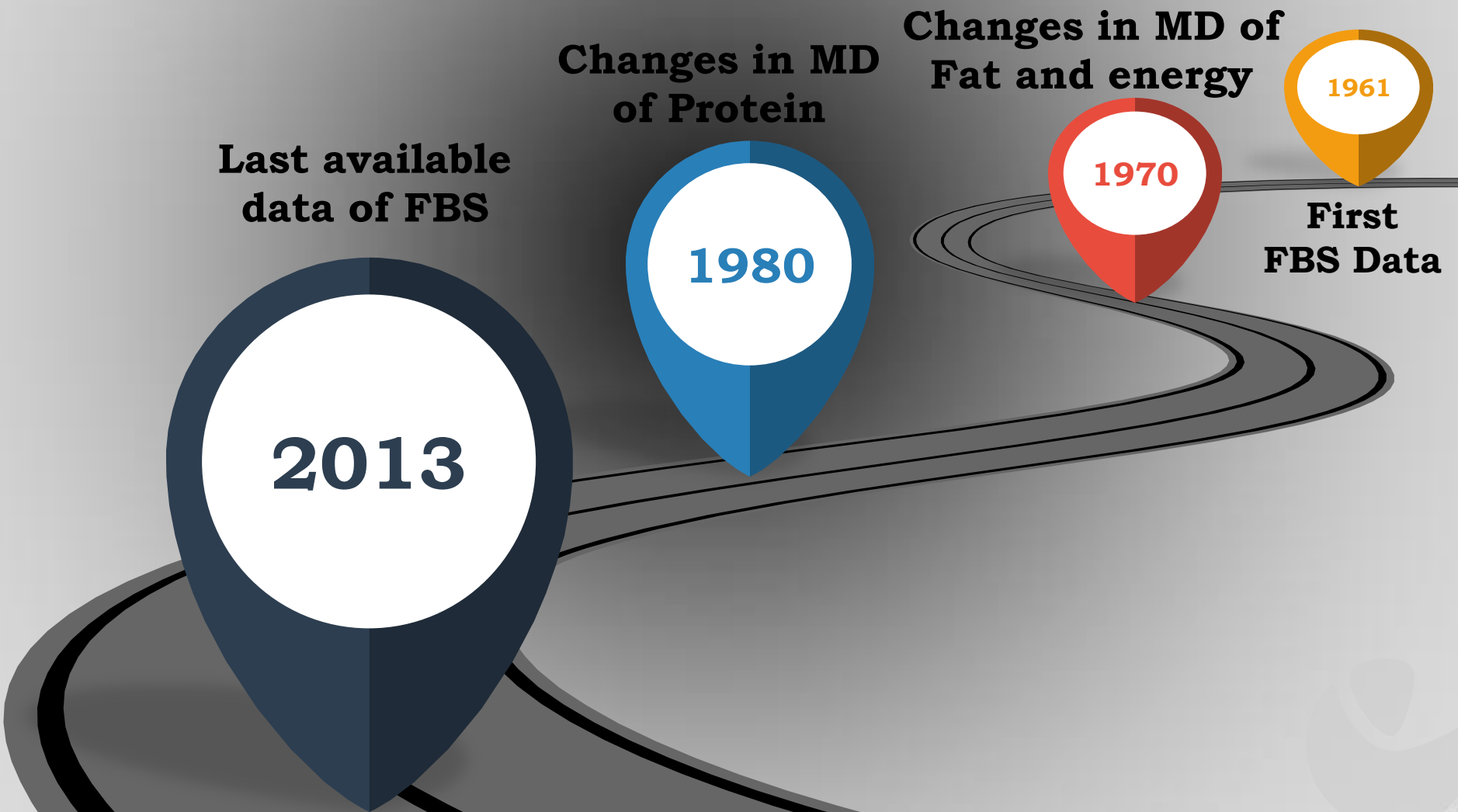
Timeline Infographics



THANK YOU