

Background to the IUSSP Debate:

"The population of humans that can be supported sustainably on the planet at a reasonable standard of living is below 4 billion." Yes or No

Joel E. Cohen

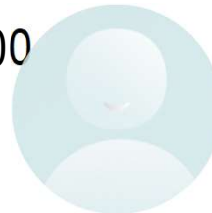
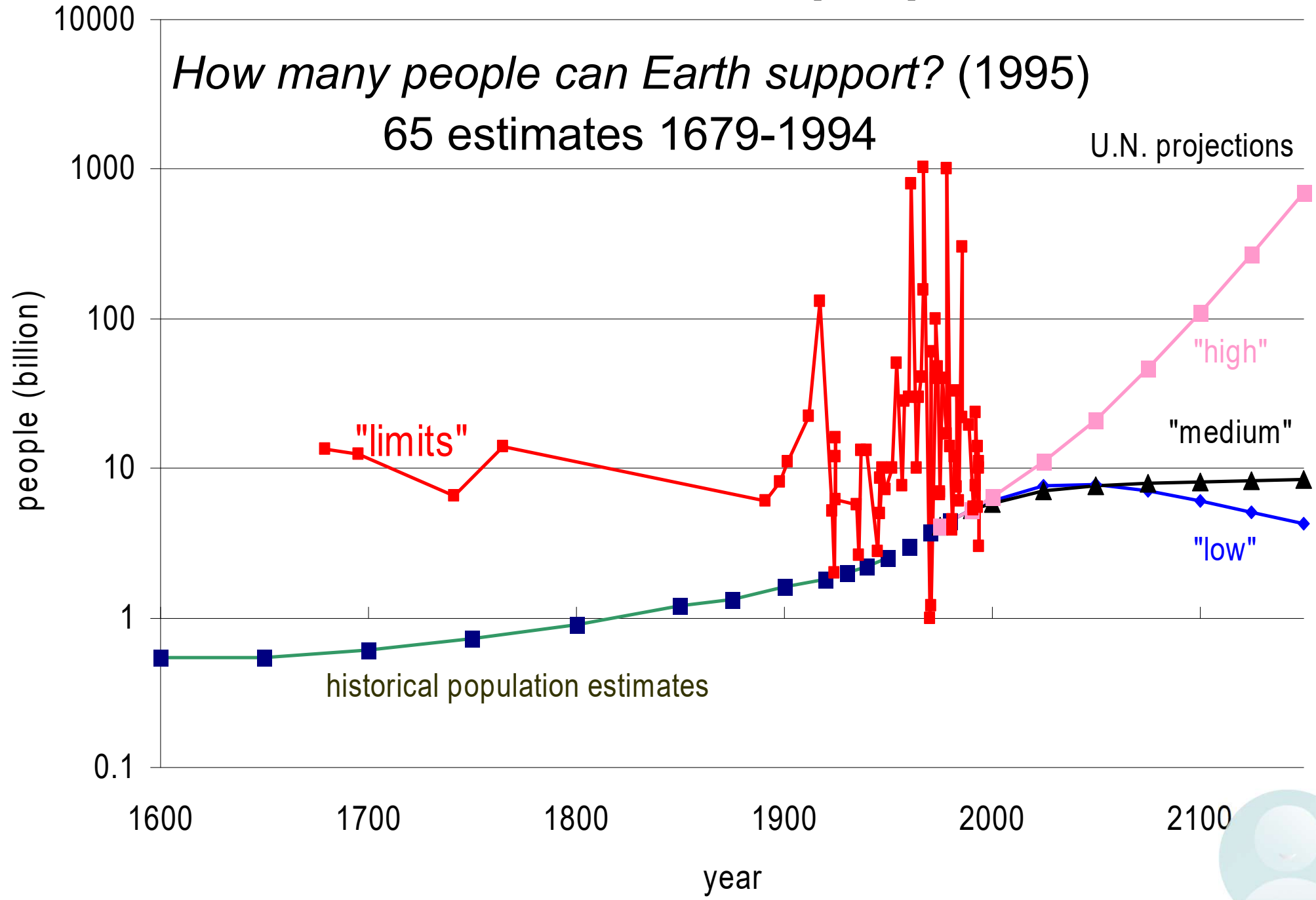
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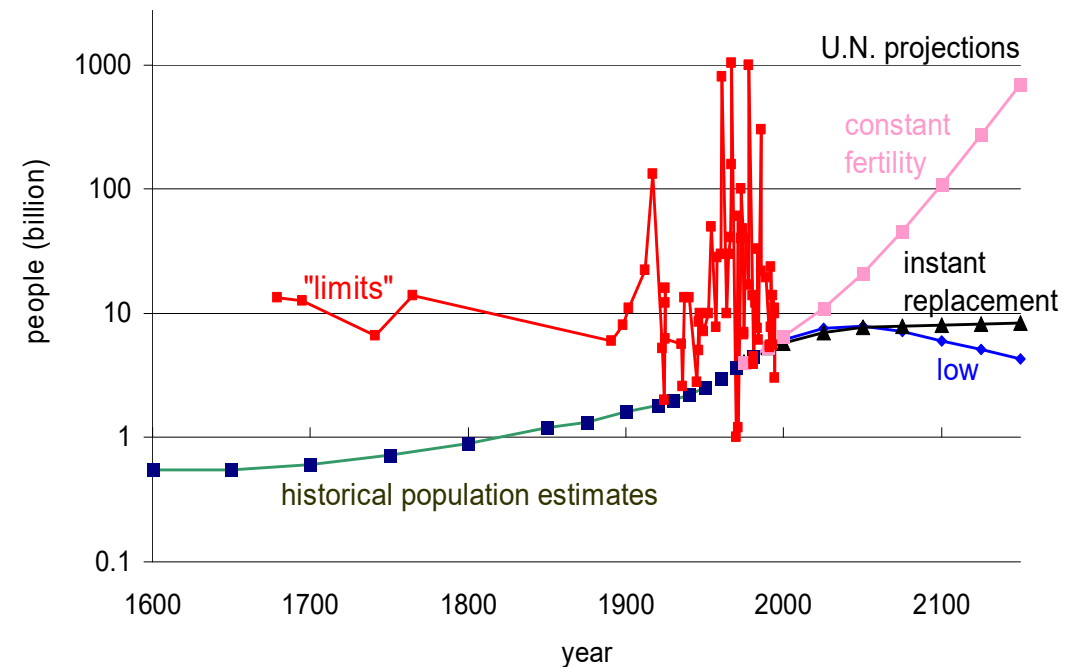
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# “Limits” of human population



# What do these estimates reveal?



1. Range in last 50 years: <1 billion to >1000 billion. They cannot all be right.
2. Variation of estimates increases with time. Numbers are more political than scientific.
3. Half of estimates lie in range 4-16 billion. Humans have entered a zone of concern.

# Outline

2 interacting factors:

natural constraints, human choices

4 interacting factors:

population, economics,  
environment, culture

11 factors define “sustainably ... at  
a reasonable standard of living”

# 2 factors: constraints, choices

1. Constraints: We do not fully understand earth's biological, chemical, and physical responses to past and future perturbations from humans and from nature.
  2. Choices: We cannot foresee many future human choices.
- 1 x 2. Future choices may affect which constraints apply. Unanticipated constraints may affect which choices are possible.

# 4 factors

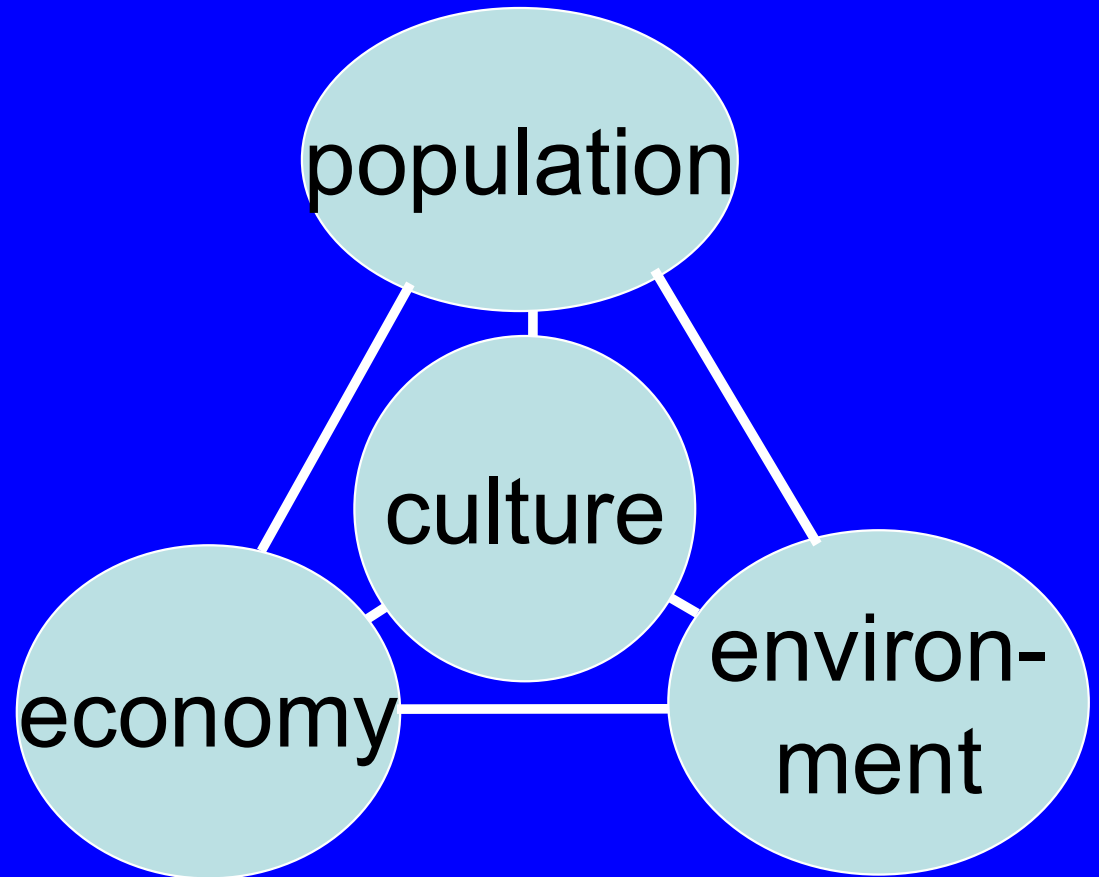
Population

Economy

Environment

Culture

interact pairwise, 3-ways, 4-ways.



How many people Earth can support depends on answers to at least 11 questions.

# How many people Earth can support depends on:

1. Average level of material & cultural well being

(food, fiber, water, housing, industrial output, health, sanitation, energy, education, travel)

2. Distribution of material & cultural well being

(extent of inequalities in income, wealth, "happiness," health, other "goods," among nations and among individuals within nations, by varied statistical measures)



How many people Earth can support depends on

### 3. Technology



# How many people Earth can support depends on

## 4. Domestic & international **political** arrangements

(means of resolving conflicts, individual freedoms, procedures for change)



# How many people Earth can support depends on

5. Domestic & international **economic** arrangements

(incentives, production, trade or tariffs, regulation within & among nations)

6. Domestic & international **demographic** arrangements

(birth, death, migration, marriage, family, households, age structure, cities)

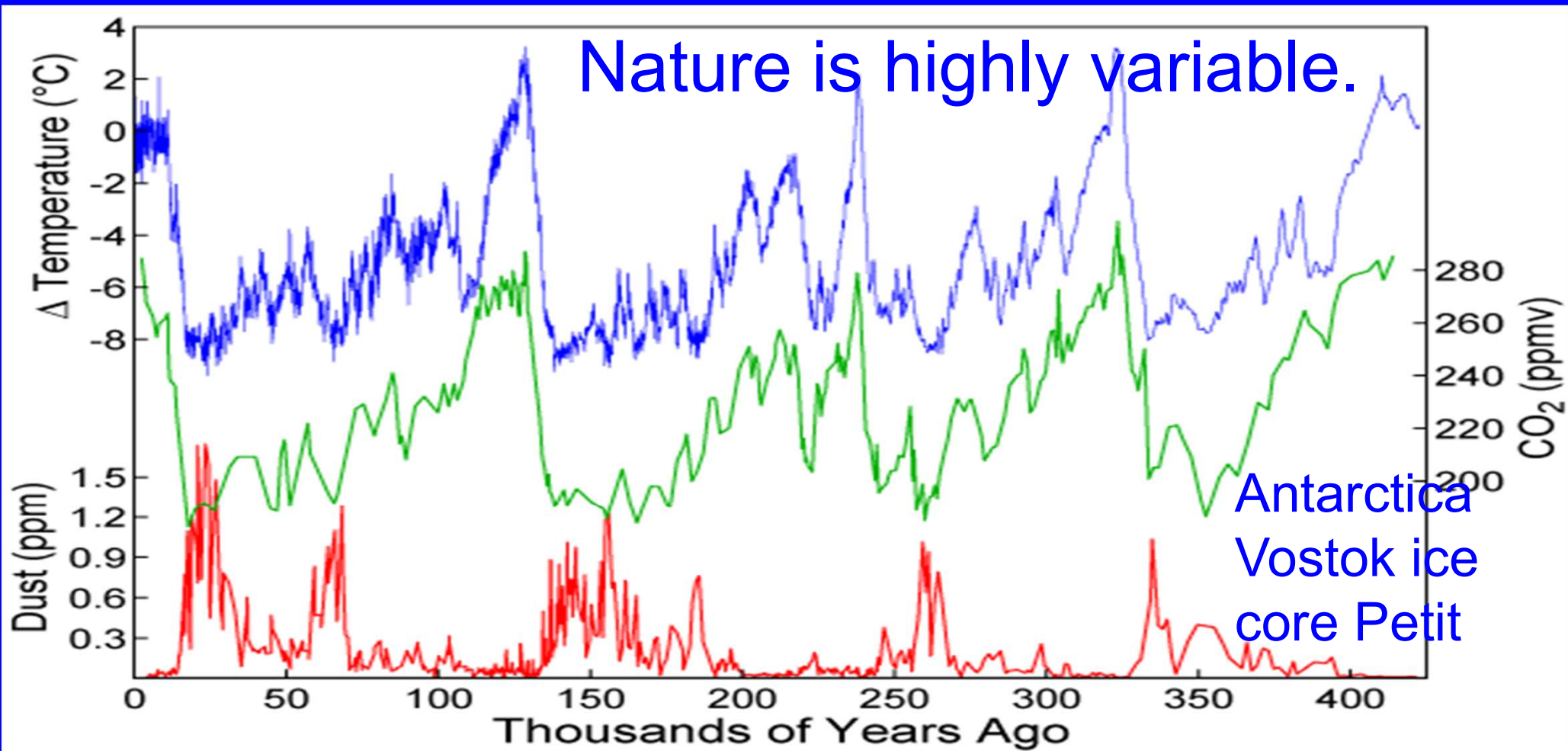
How many people Earth can support  
depends on

## 7. Physical, chemical & biological environments



# How many people Earth can support depends on

## 8. Desired variability or stability of population



# How many people Earth can support depends on

9. Risk or robustness

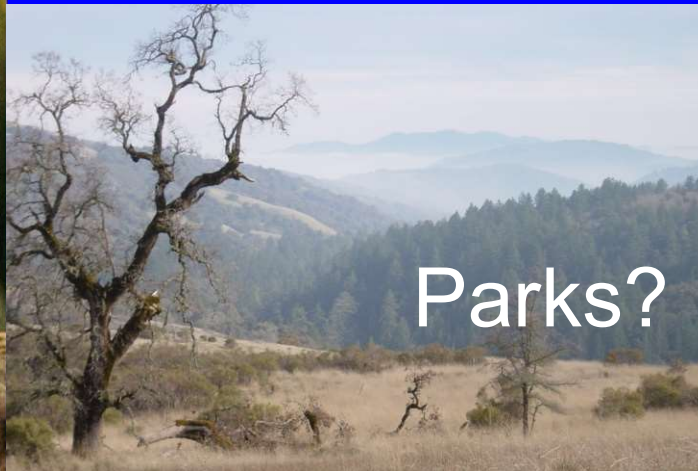
10. Time horizon

11. Values, tastes & fashions

Hurricane Katrina flooding



4 legs?



Parks?



4 wheels?



Parking lots?



# Proposed panaceas

## Bigger pie

increase productivity of people & machines

## Fewer forks

slow population growth through voluntary reductions in fertility

## Better manners

reduce violence, corruption, inequities, barriers to efficiency

reduce unwanted material by-products of consumption & production



Cohen, *How Many People Can the Earth Support?* 1995

# Thank you! Questions?

Najibullah Musafar / Aina Photo

