



The
University
Of
Sheffield.



Optimising Solar Panel Use

A Tale of Two Departments

Conference on Human Behaviour & Climate Change
Thursday 22nd September 2011,
School of Psychology, Cardiff University

James Williams





Contents

- A bit about me
- E-Futures
- The problems we face in energy
- The research I am conducting, solar thermal panels
- Mechanical Engineering
- My work so far in Psychology
- Implications
- Future work



A bit about me

- Aerospace Engineering Degree and Masters
- Masters in Environmental Engineering
- E-Futures PhD, DTC

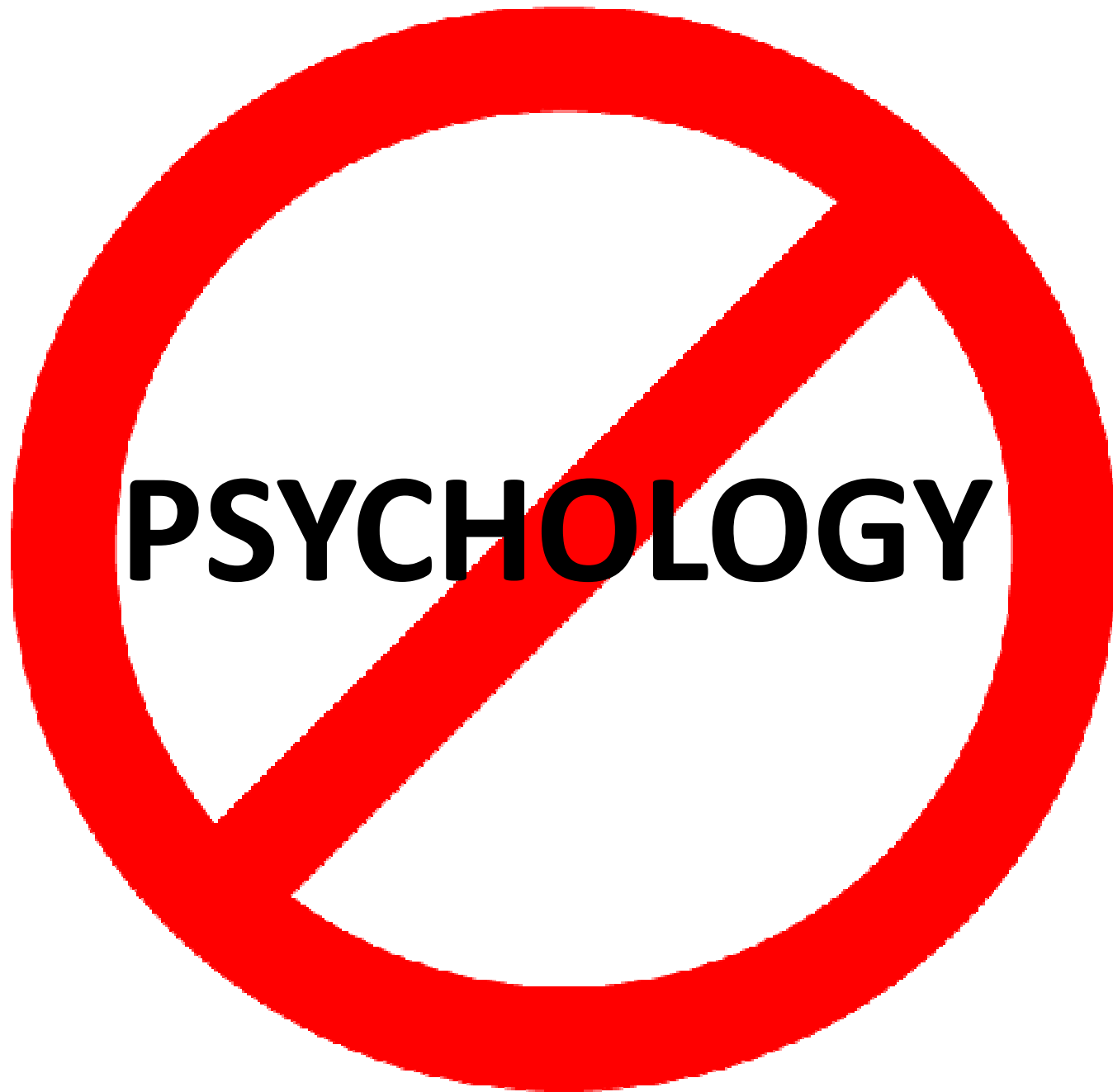
Solar thermal panels



Mechanical Engineering



Psychology

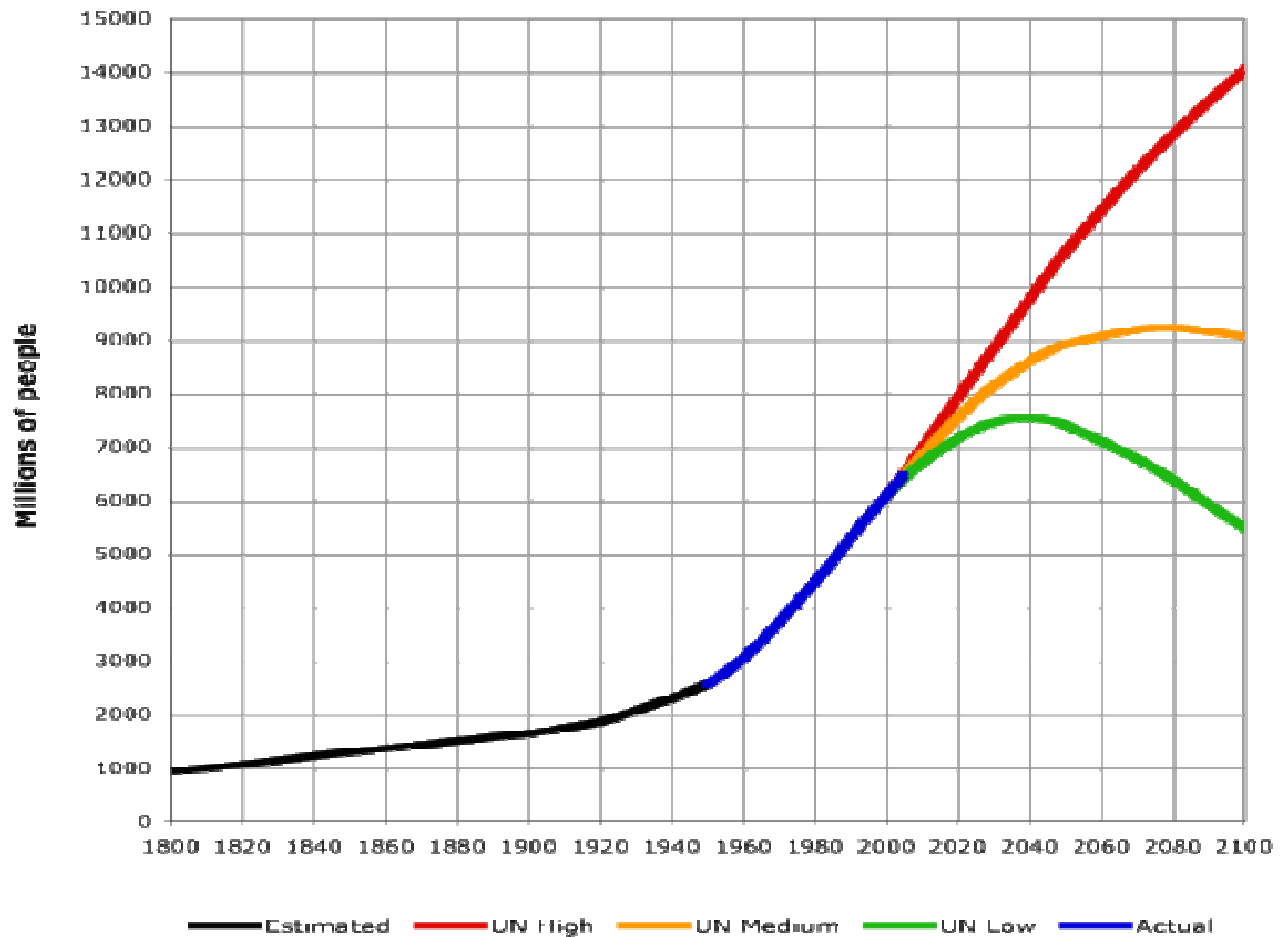


PSYCHOLOGY



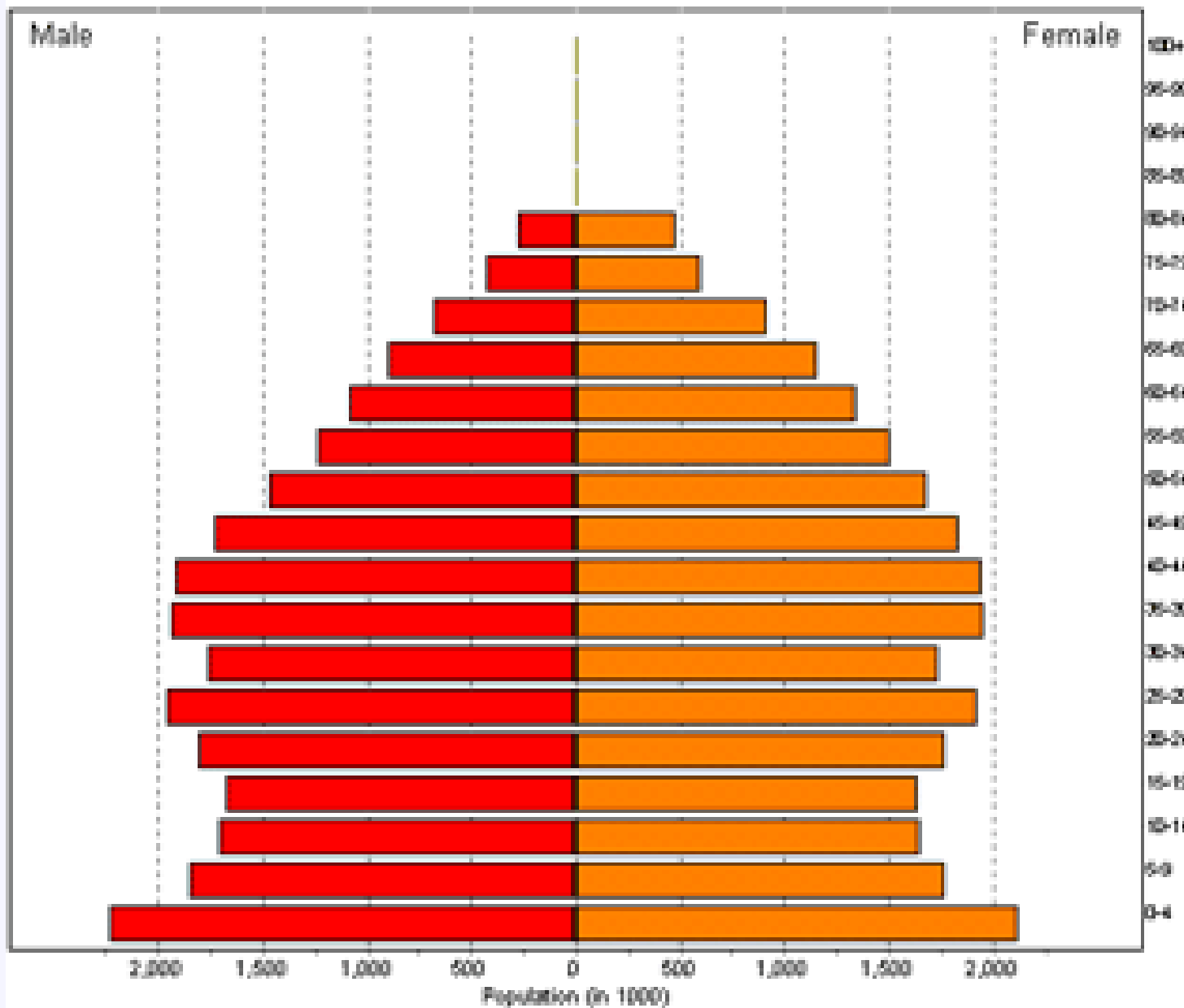
E-Futures

- 4 year PhD
- 21 students from a variety of backgrounds
 - Engineers
 - Biologists
 - Chemists
 - Physicists
 - Geographers (!)
- A cross disciplinary approach
- Have to be across two departments
- After first year of further learning we disappeared into our respective departments



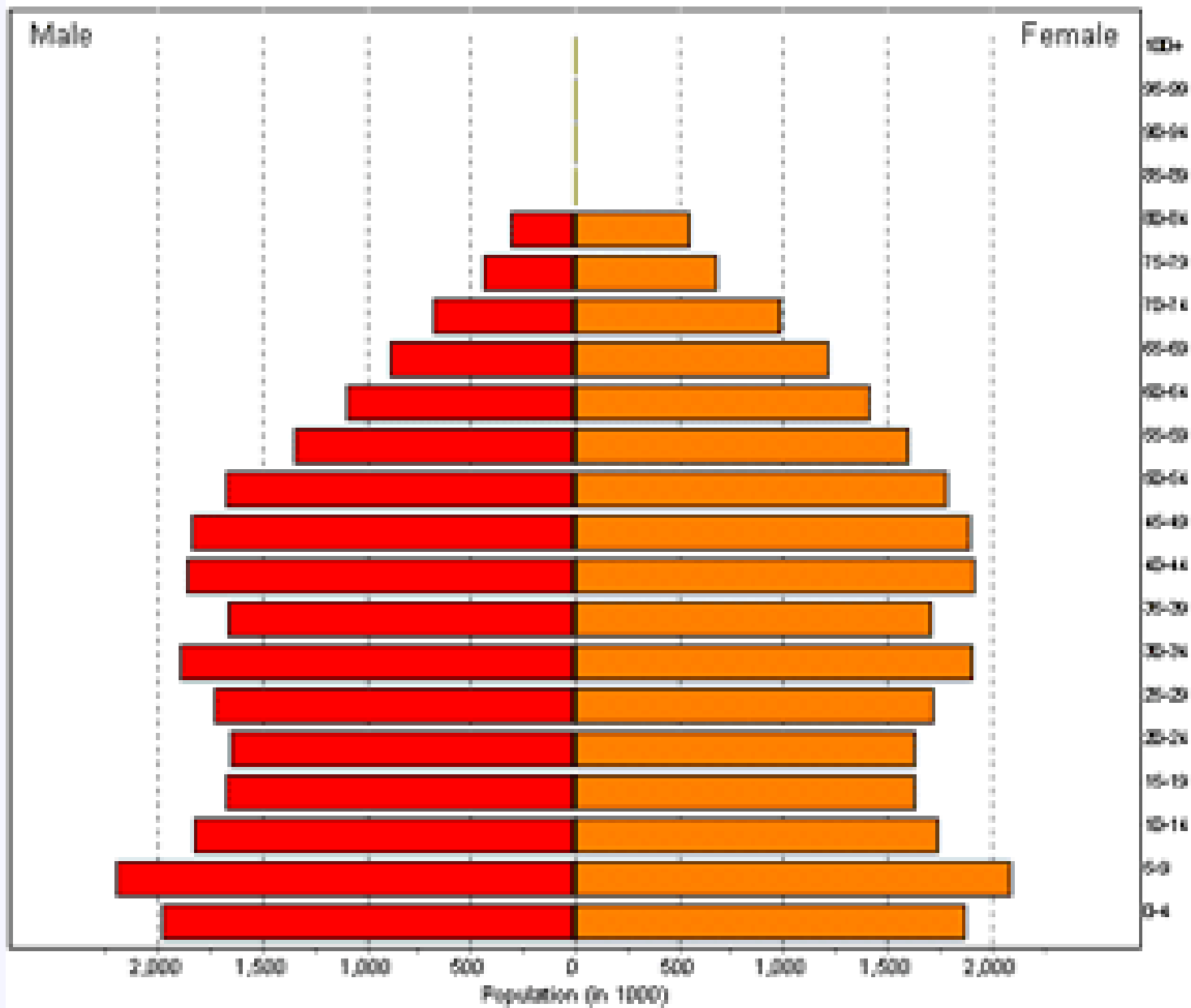
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Medium Variant

1950



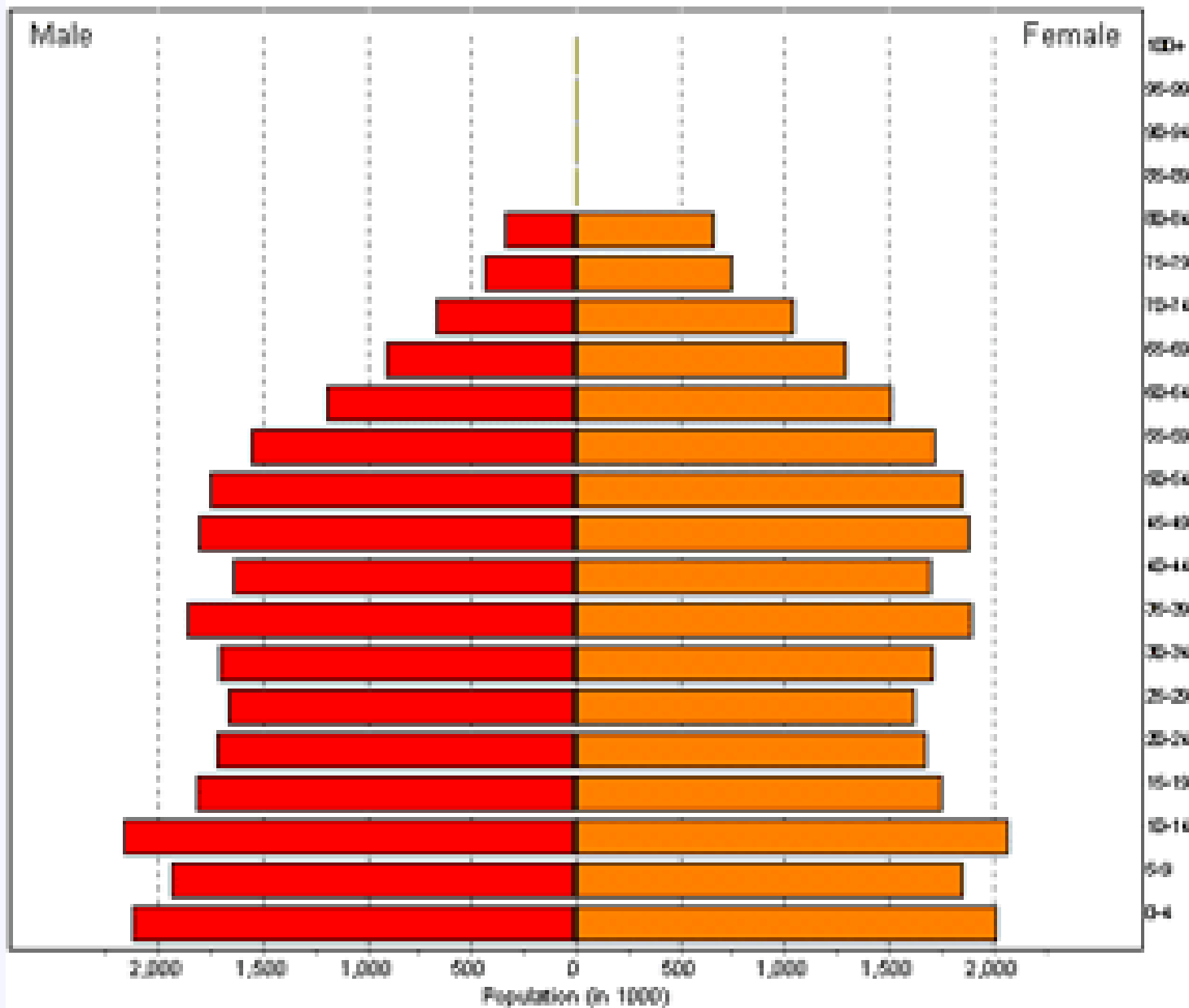
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Medium Variant

1955



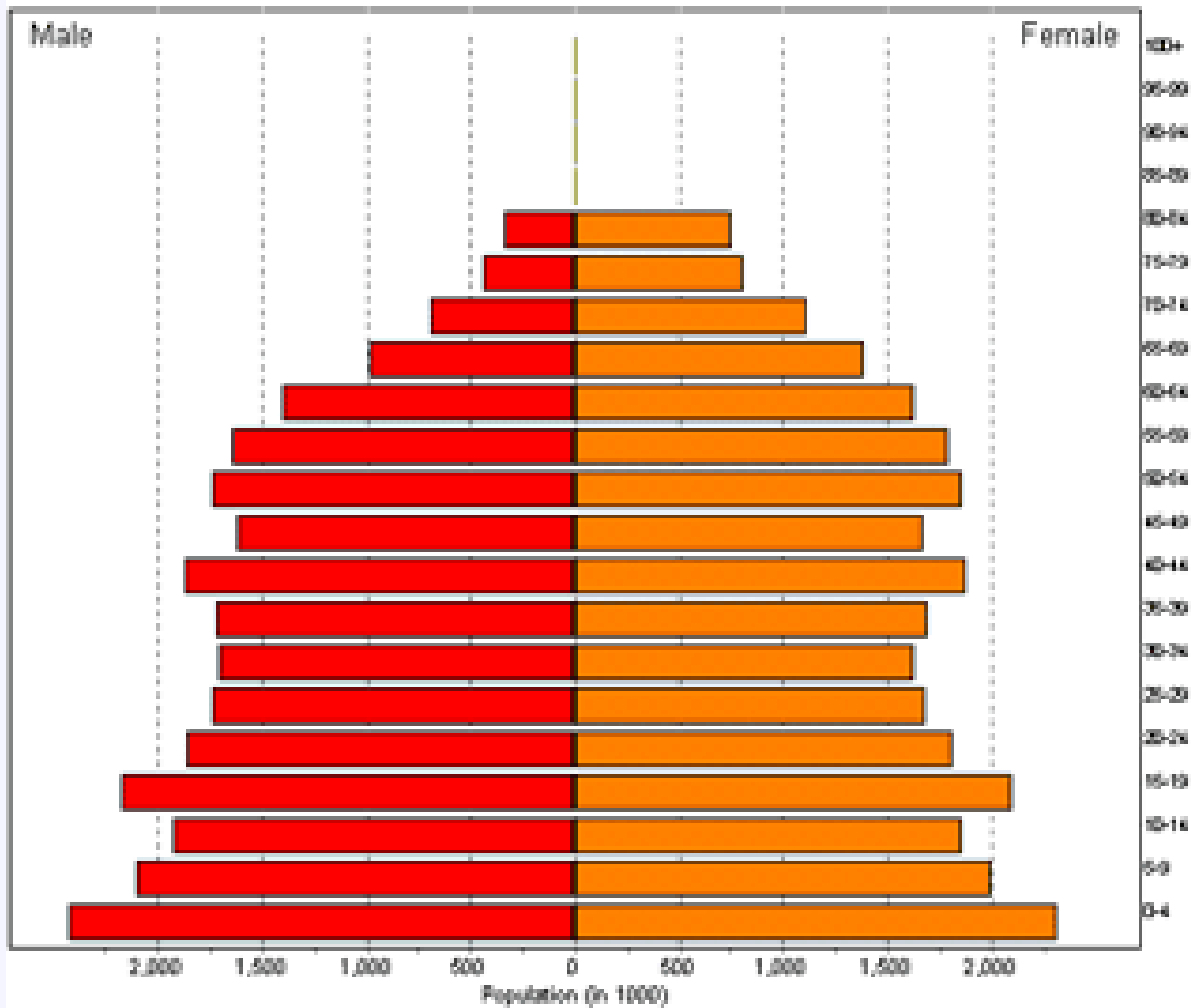
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1960



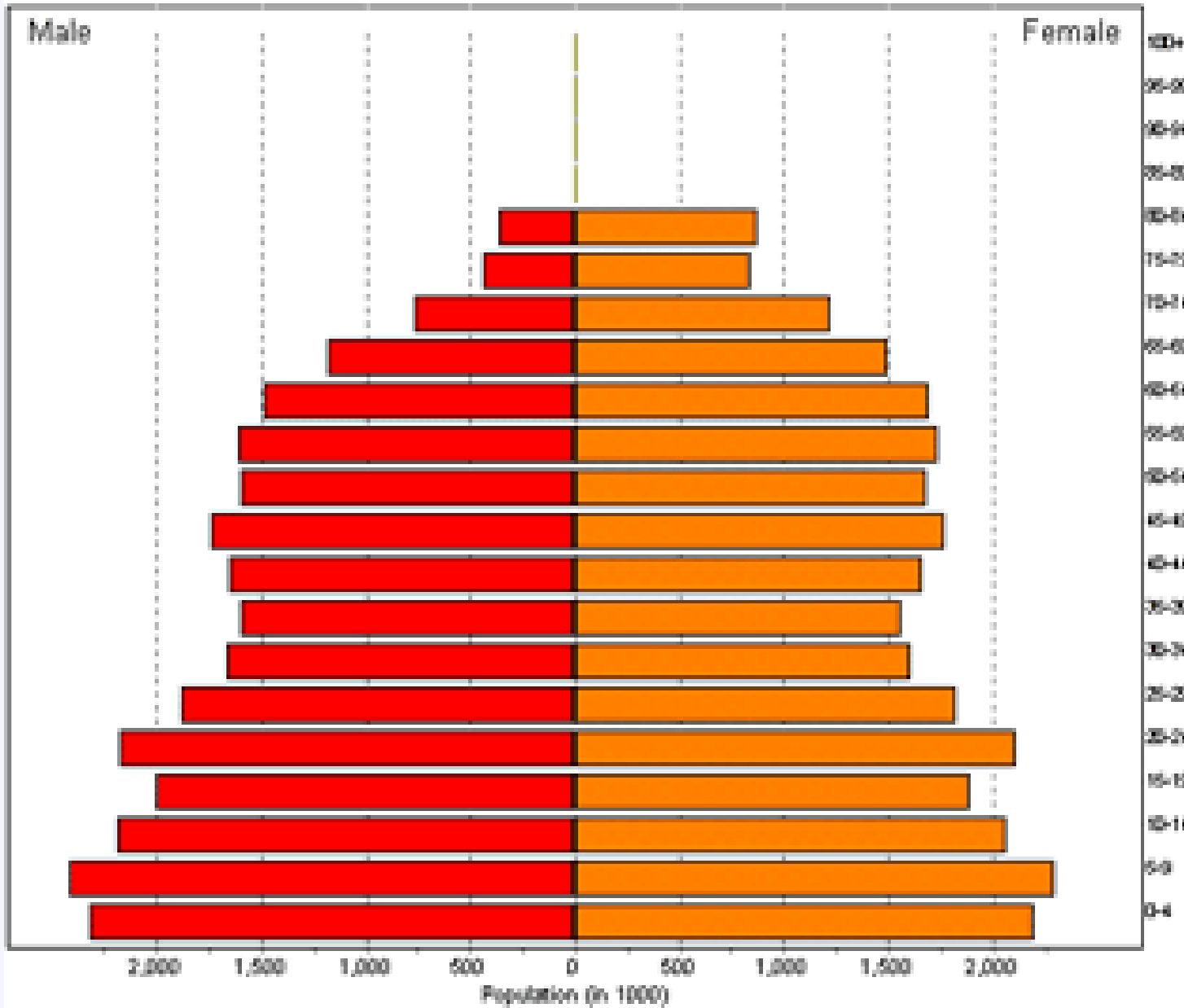
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Medium Variant

1965



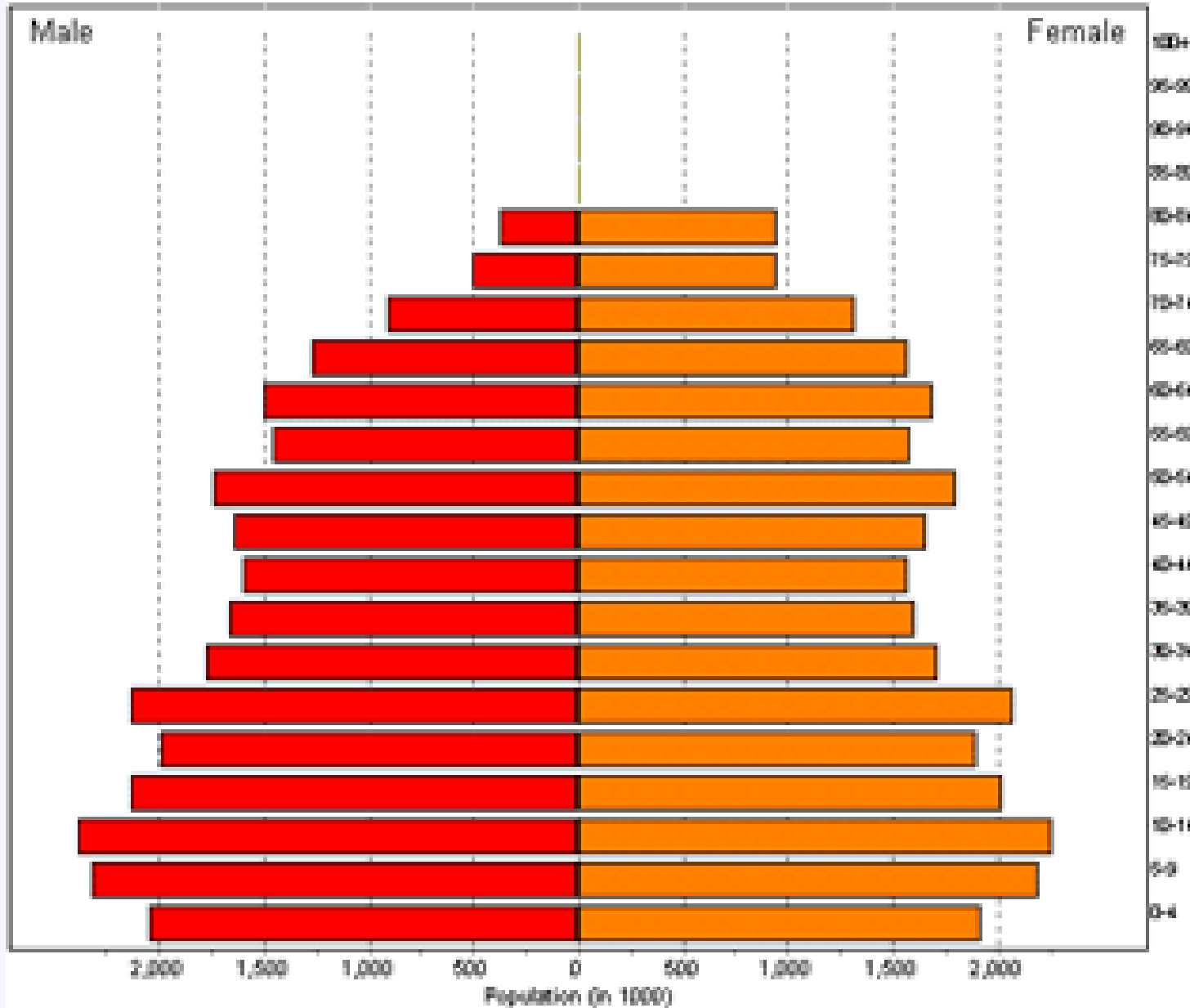
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1970



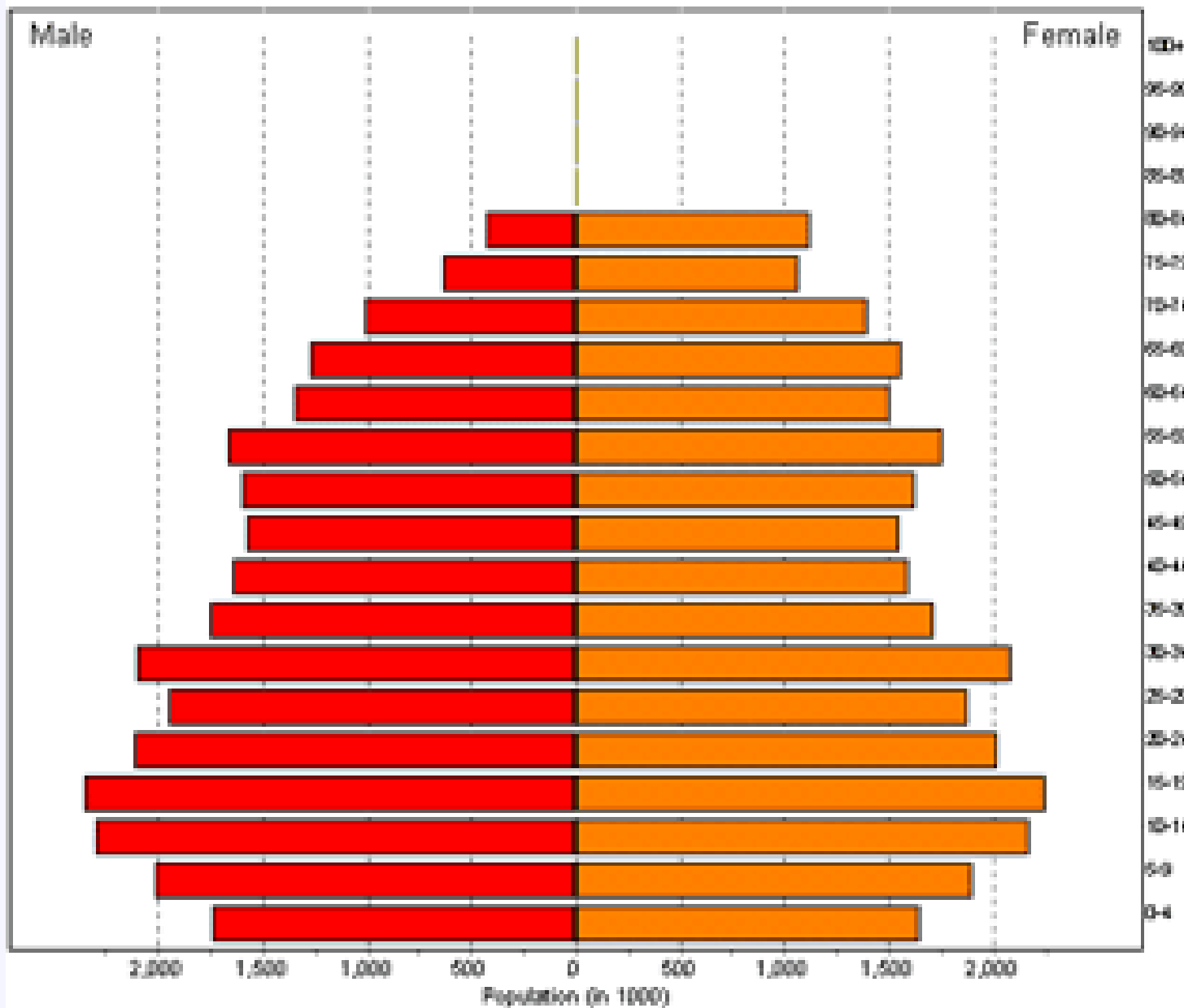
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1975



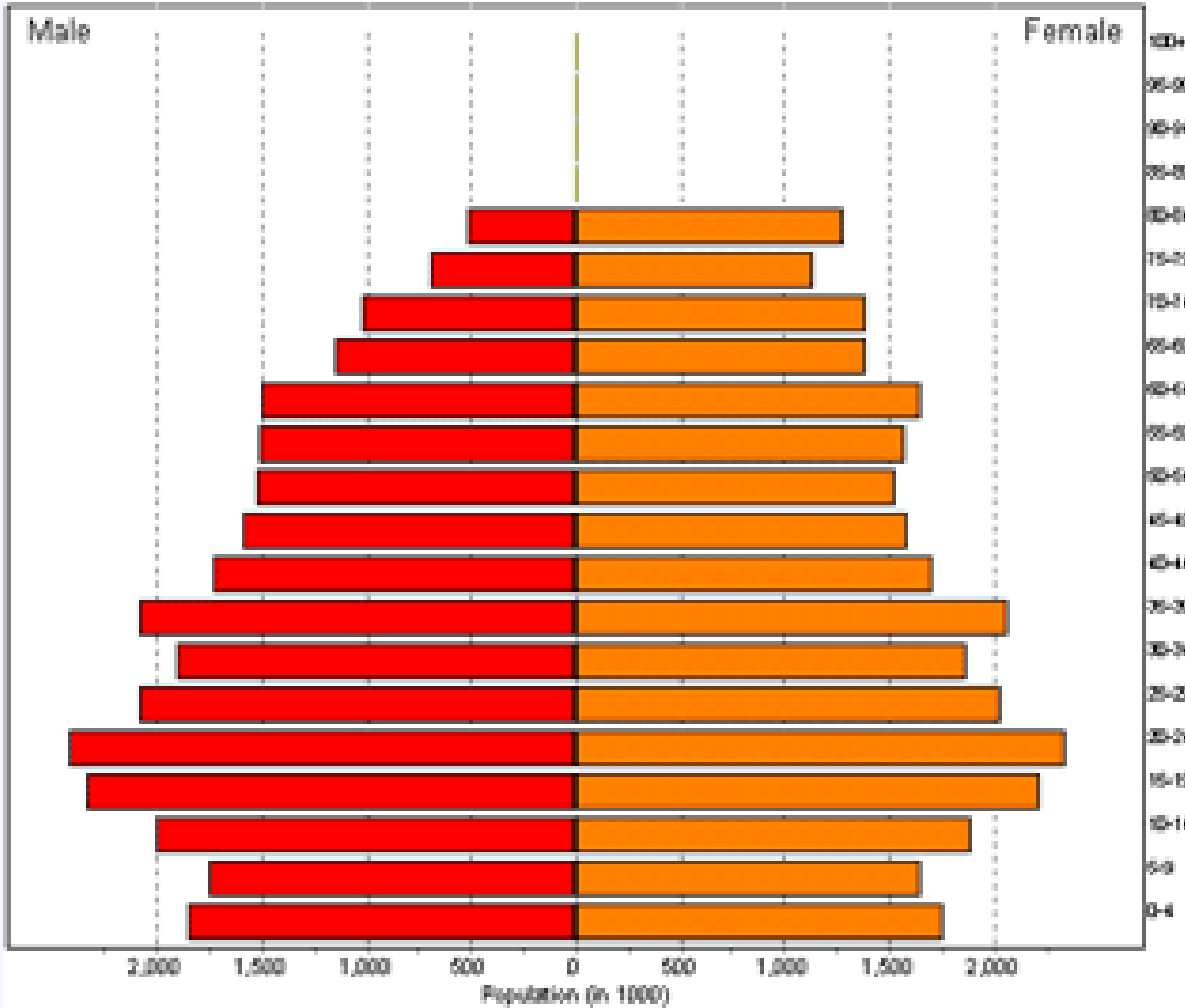
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1980



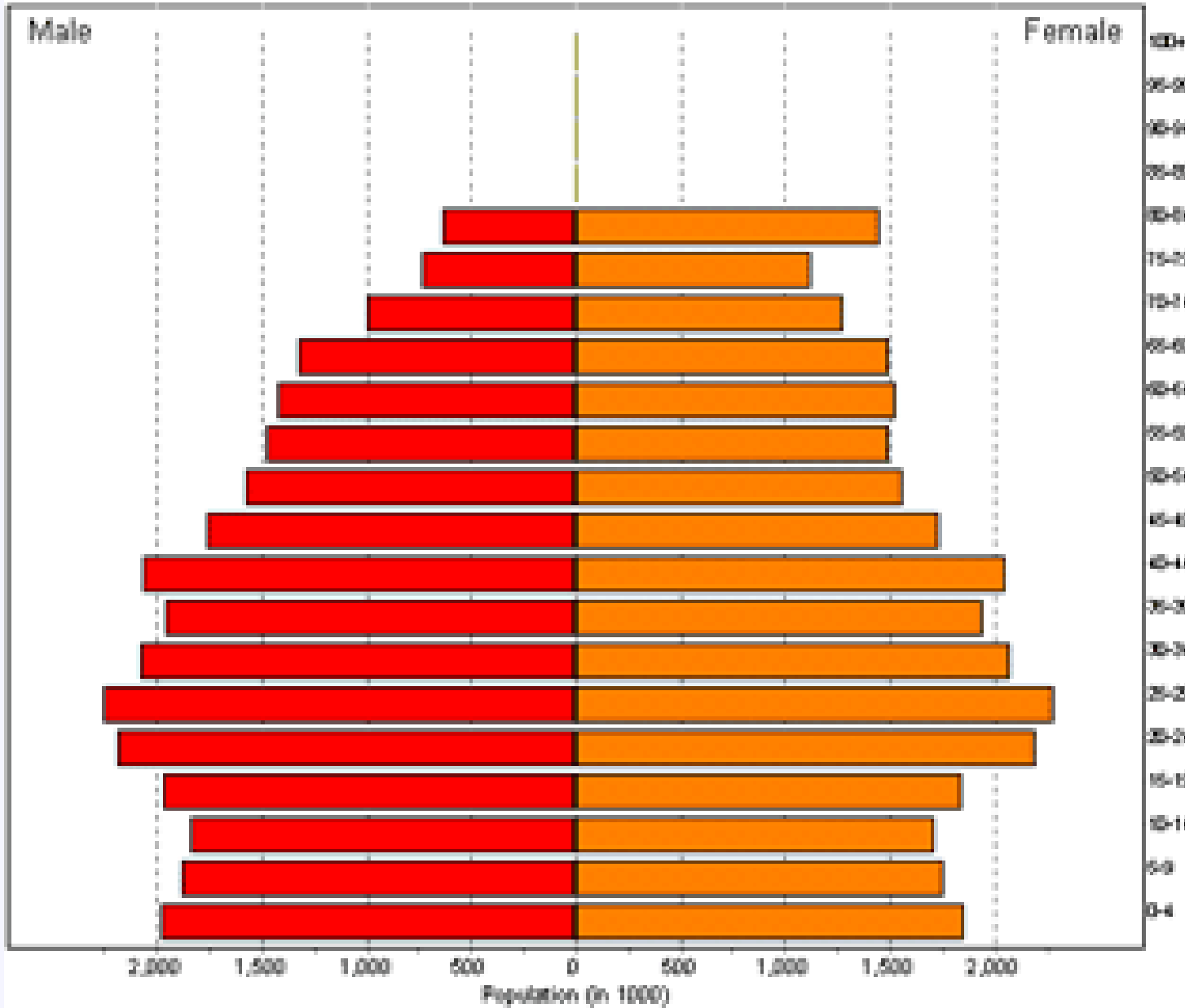
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1985



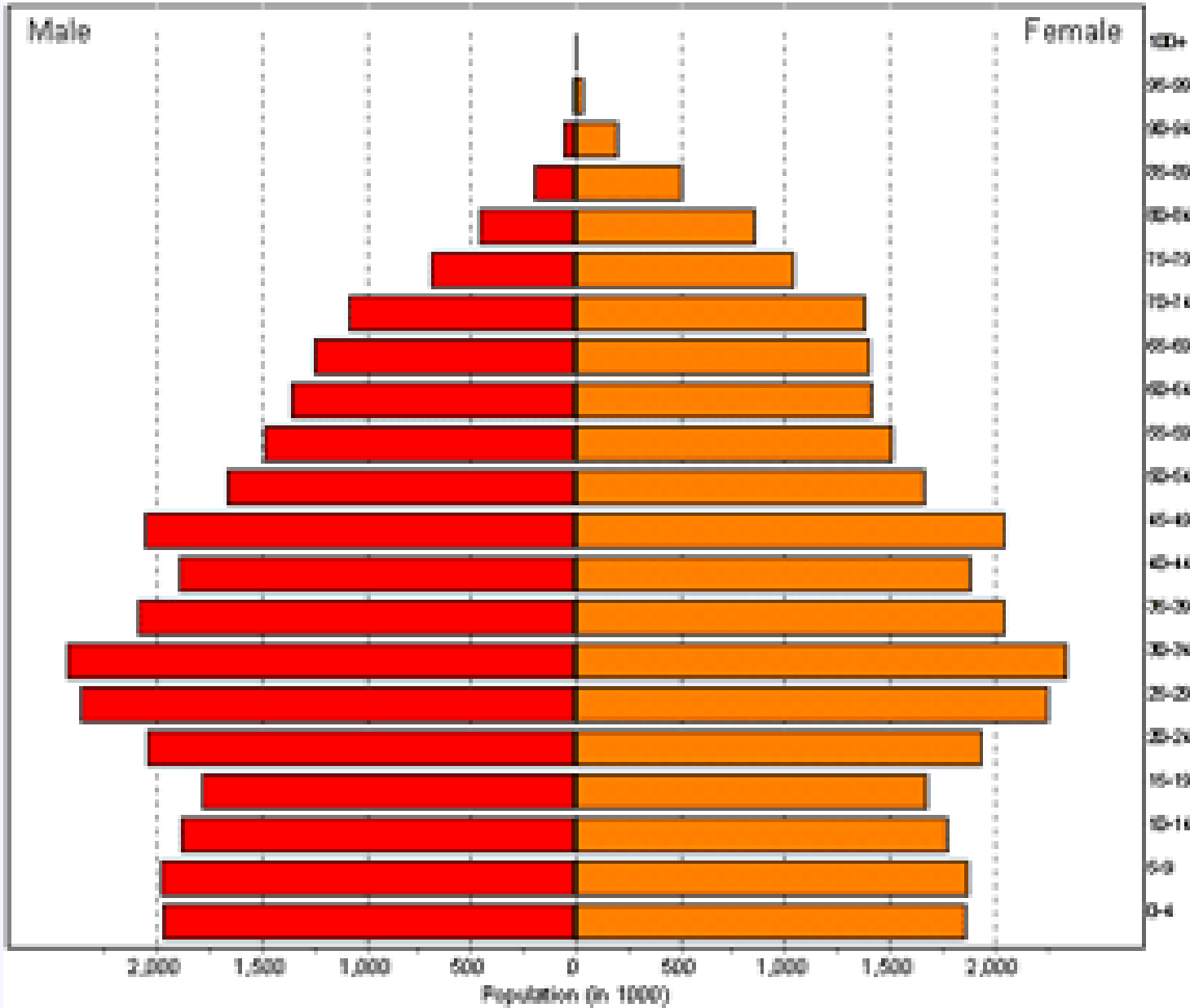
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1990



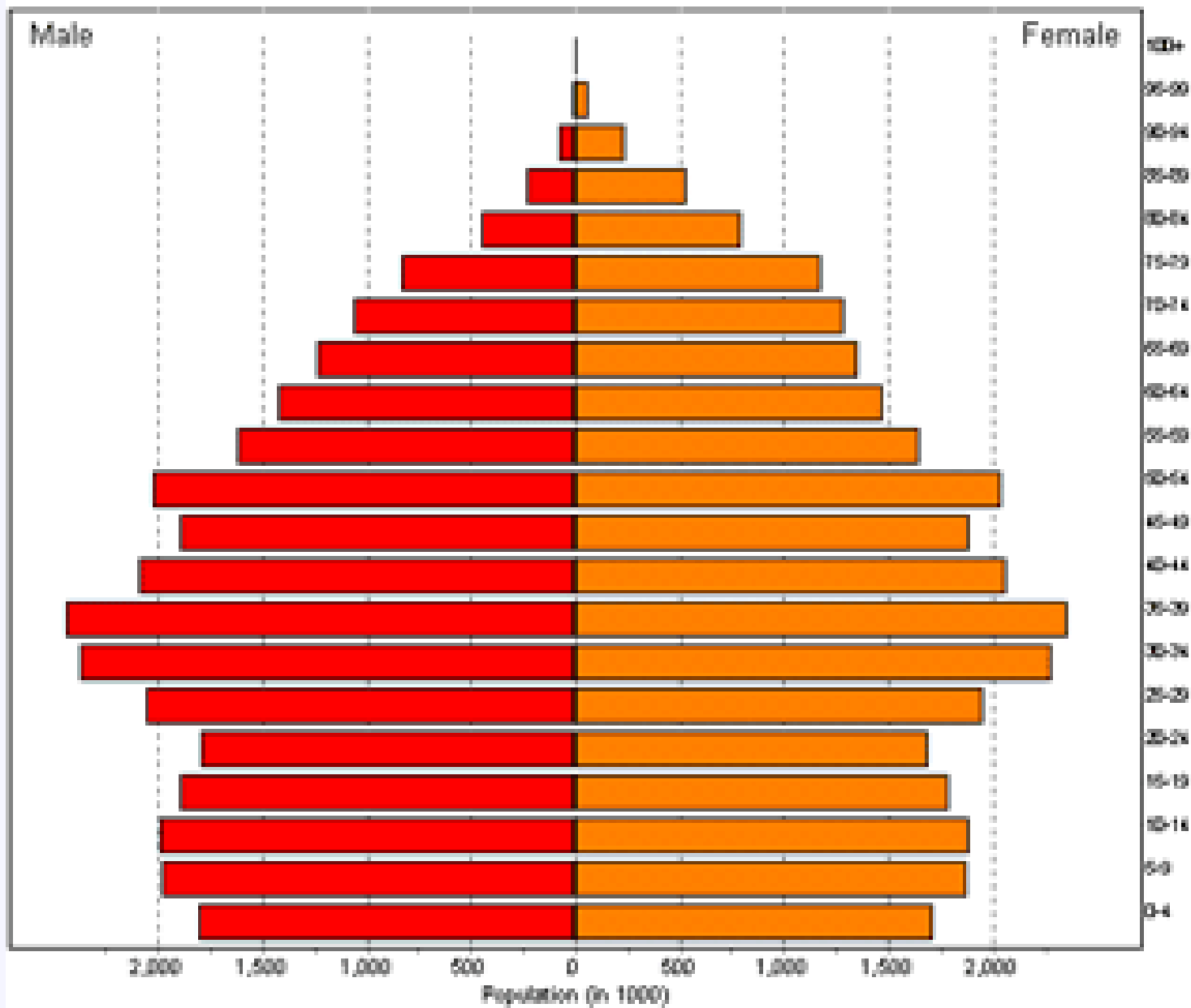
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1995



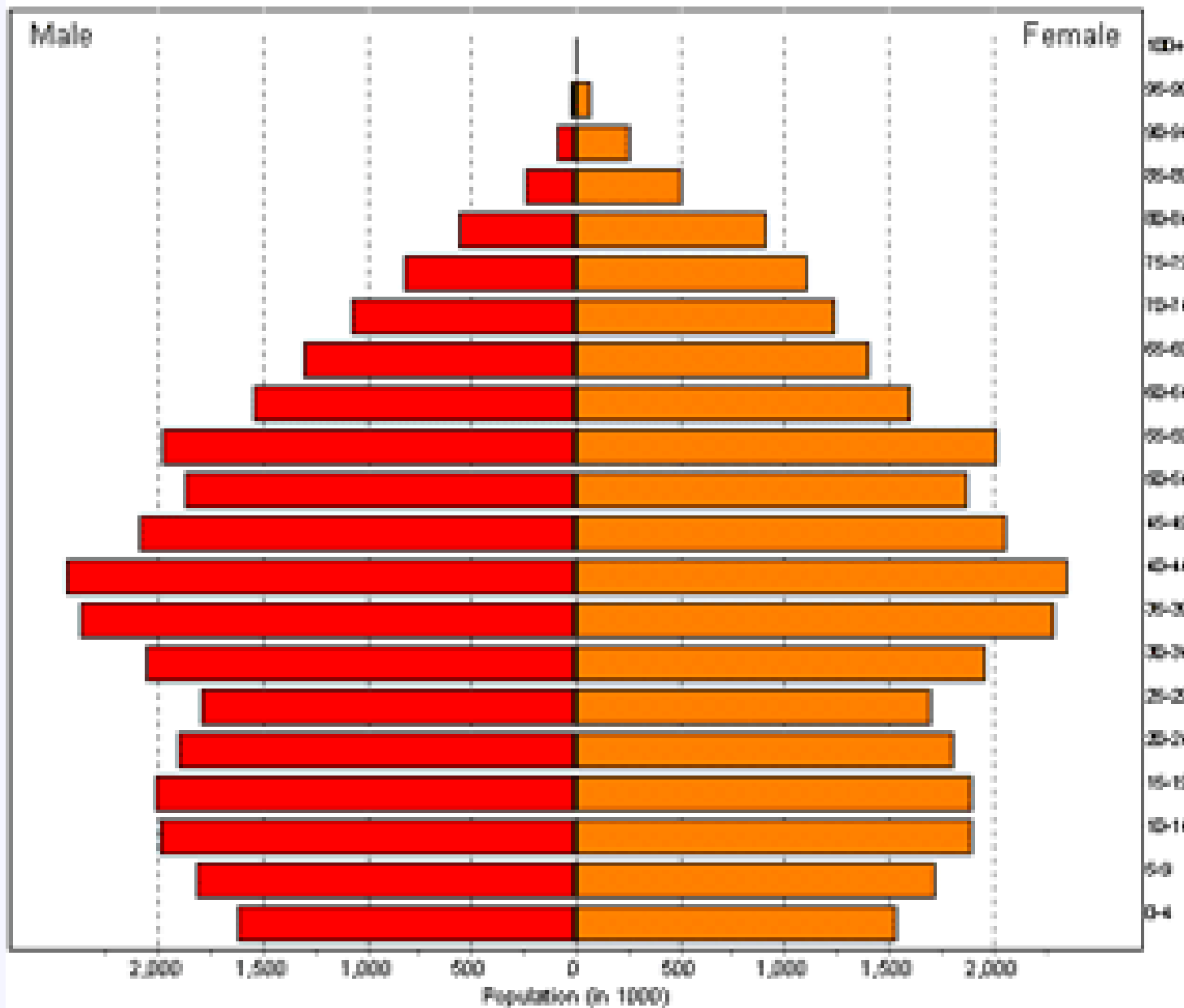
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2000



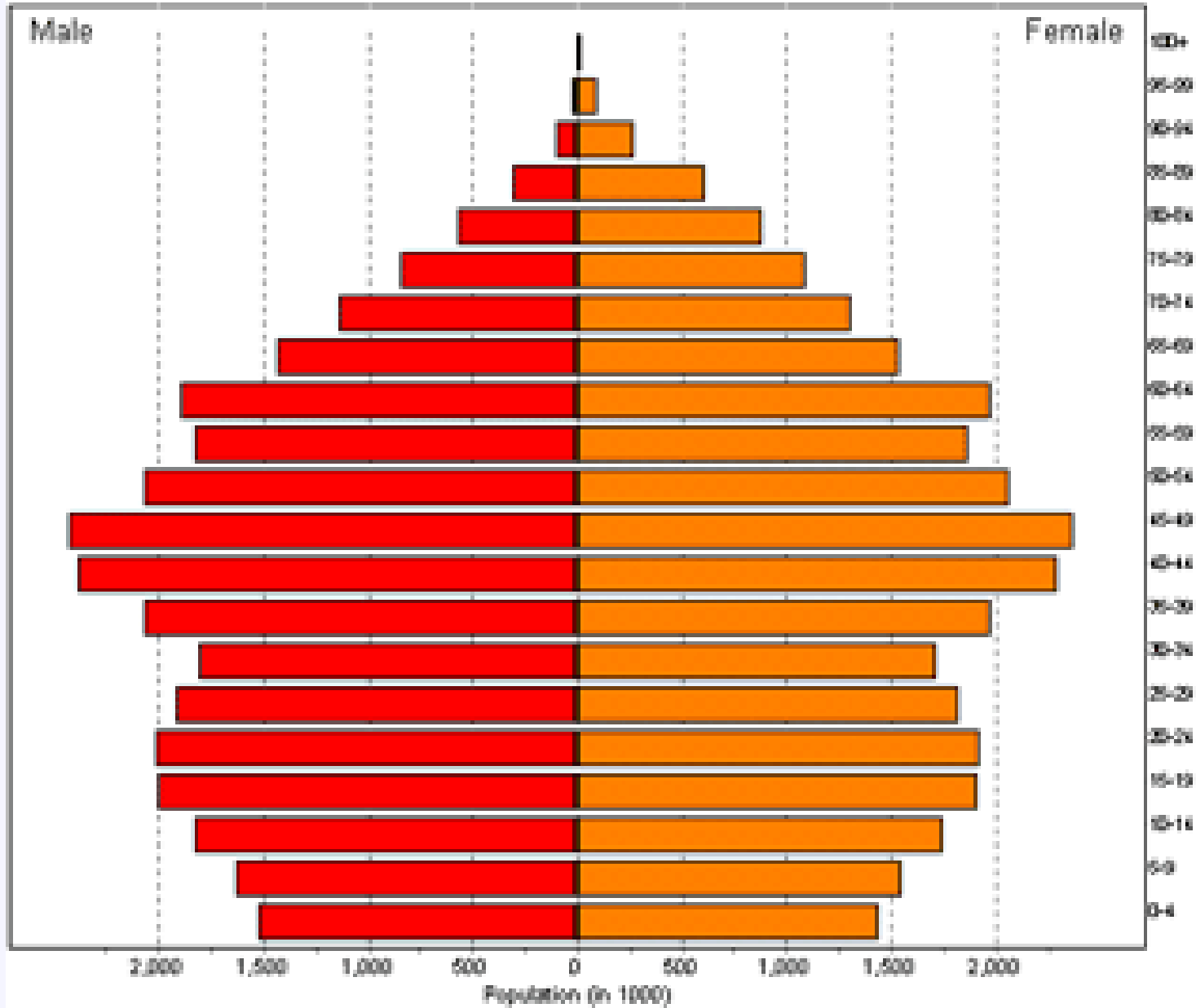
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Medium Variant

2005



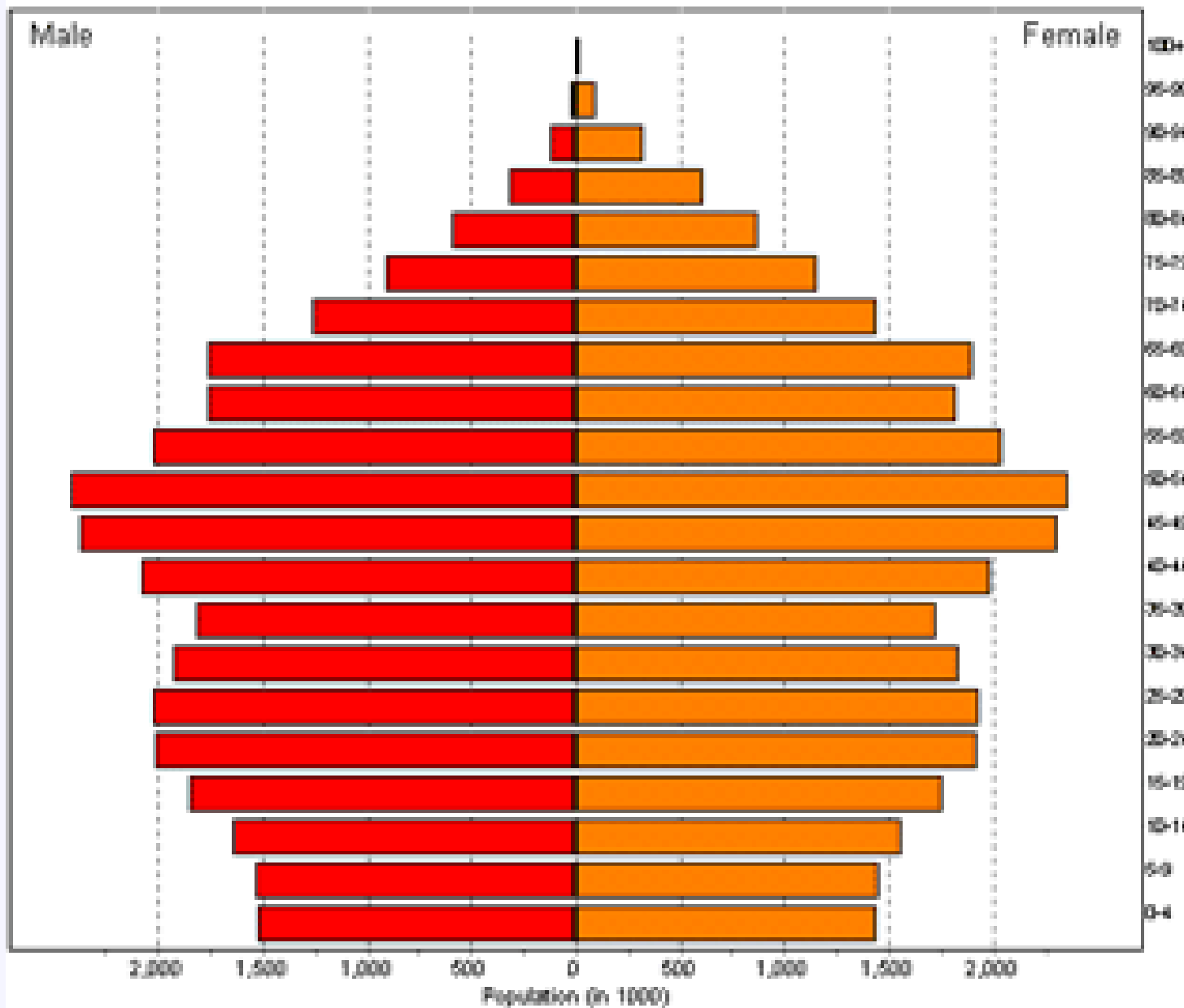
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2010



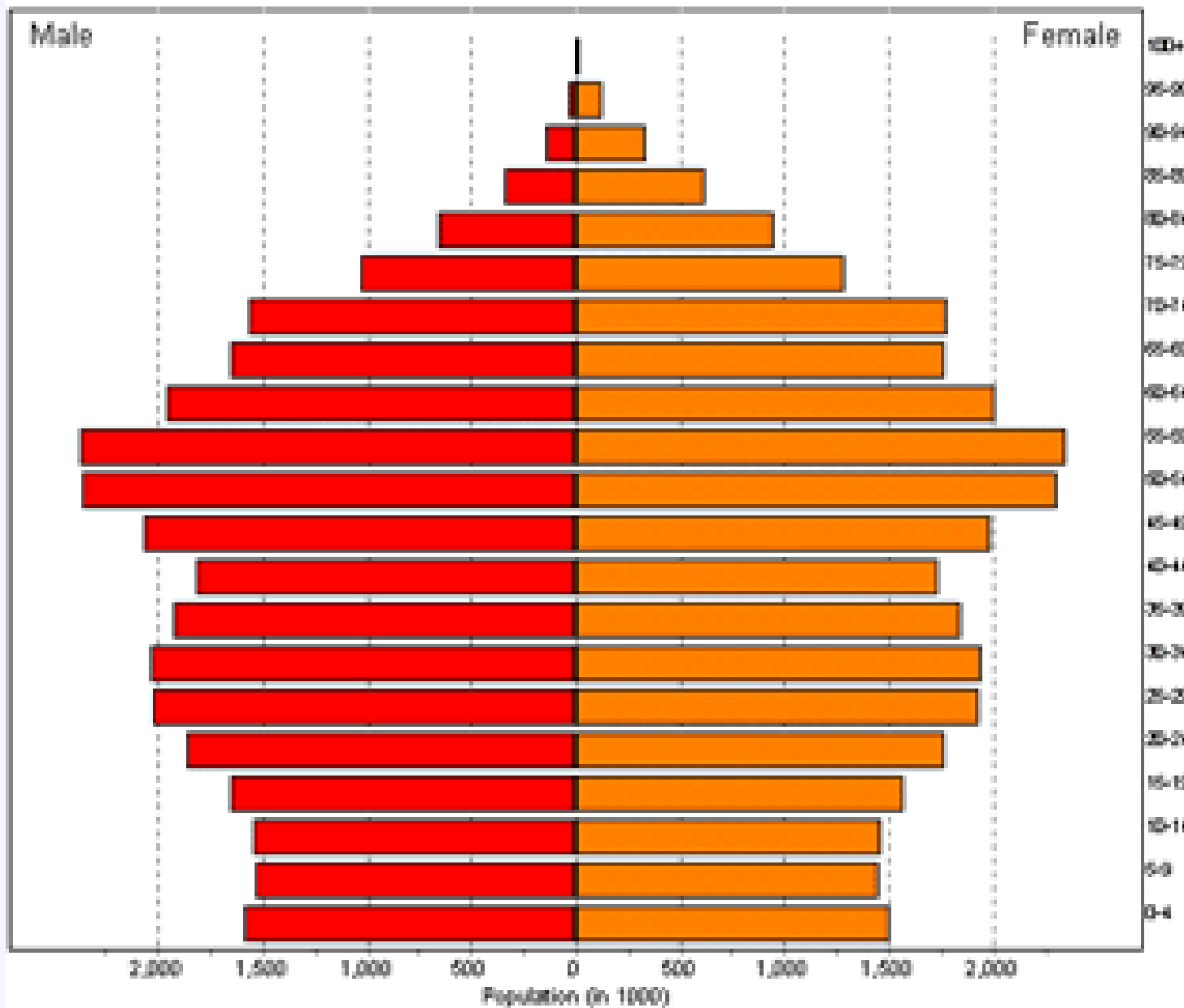
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Medium Variant

2015



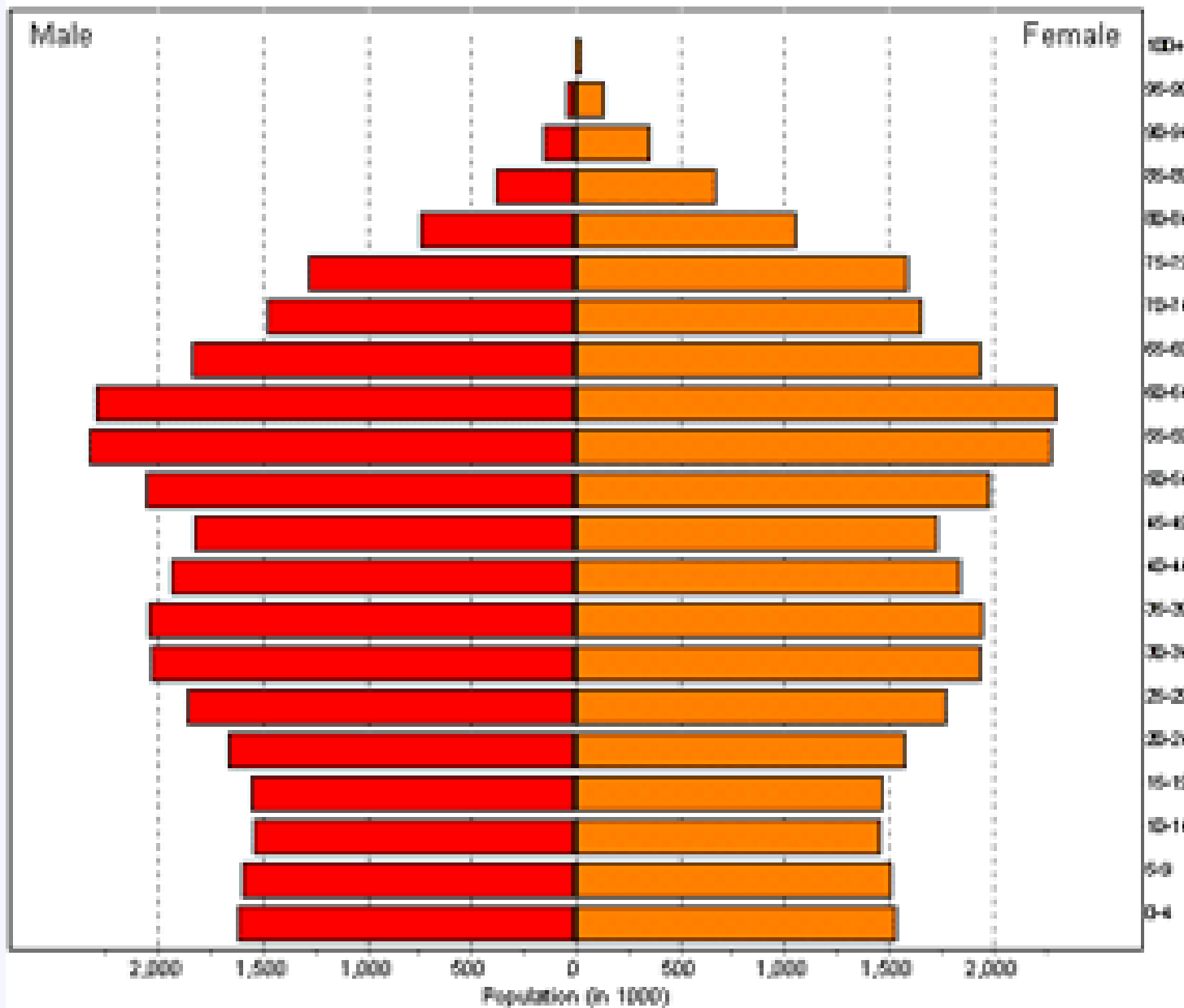
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Medium Variant

2020



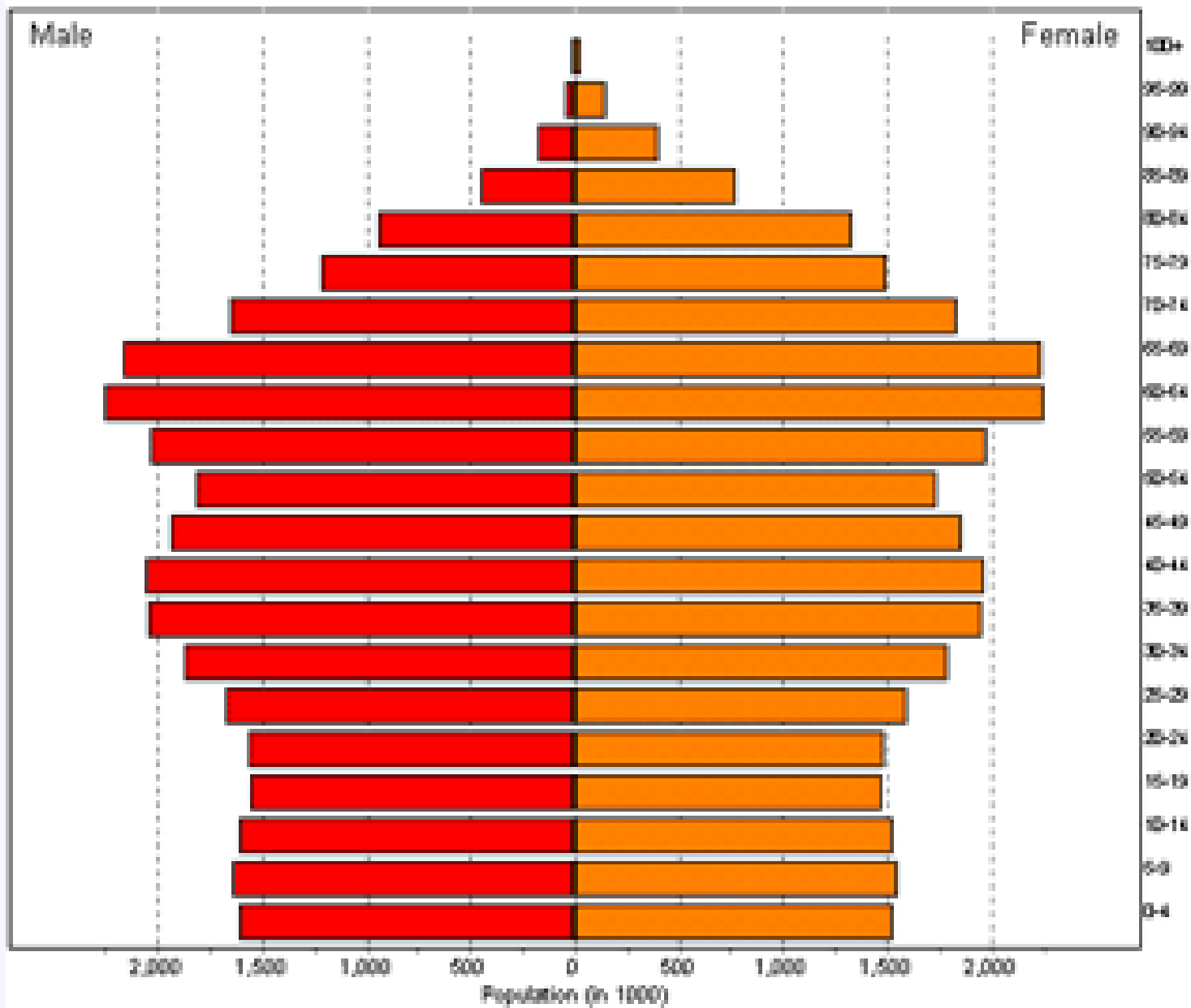
United Kingdom
Medium Variant

2025



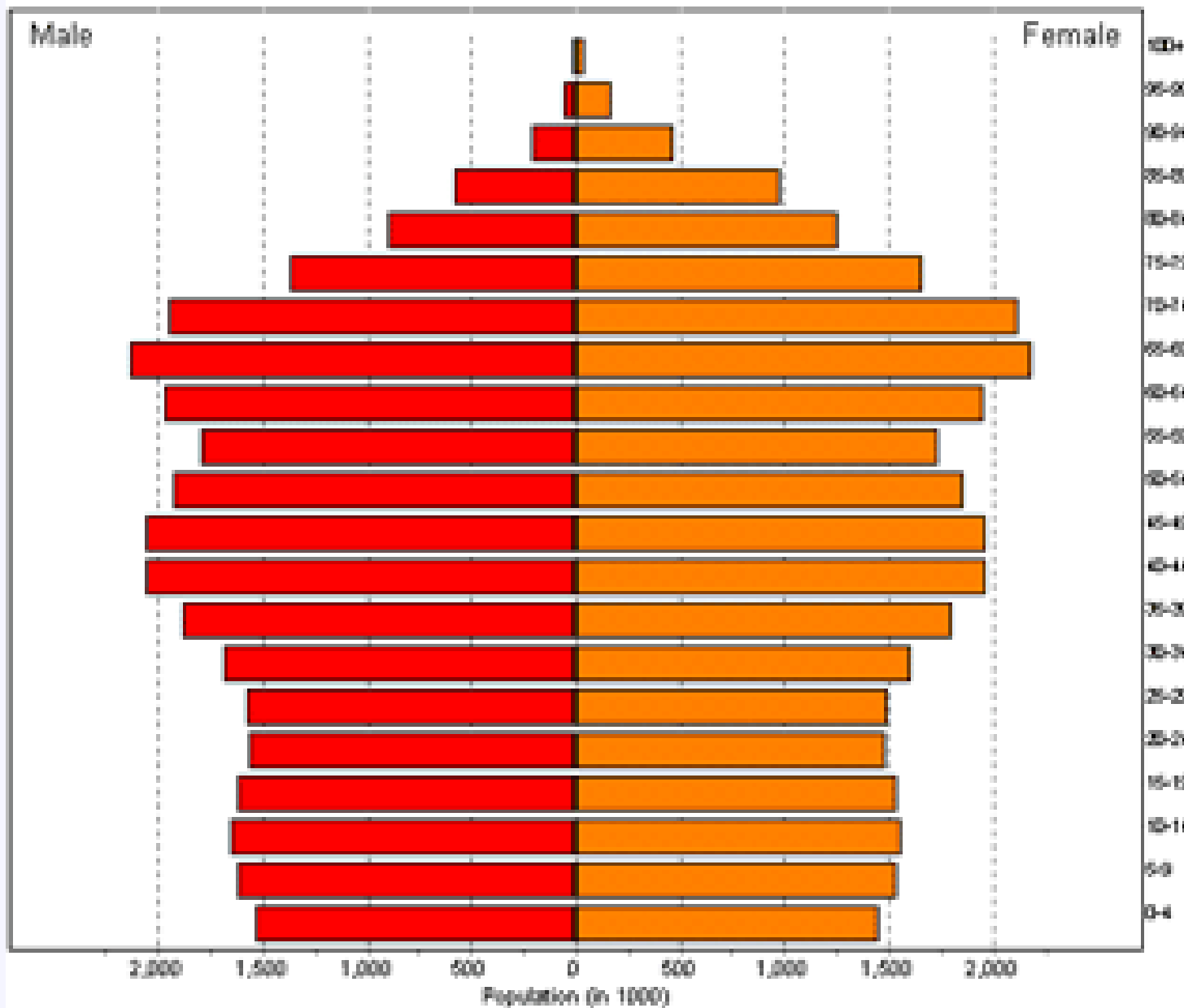
United Kingdom
Medium Variant

2030



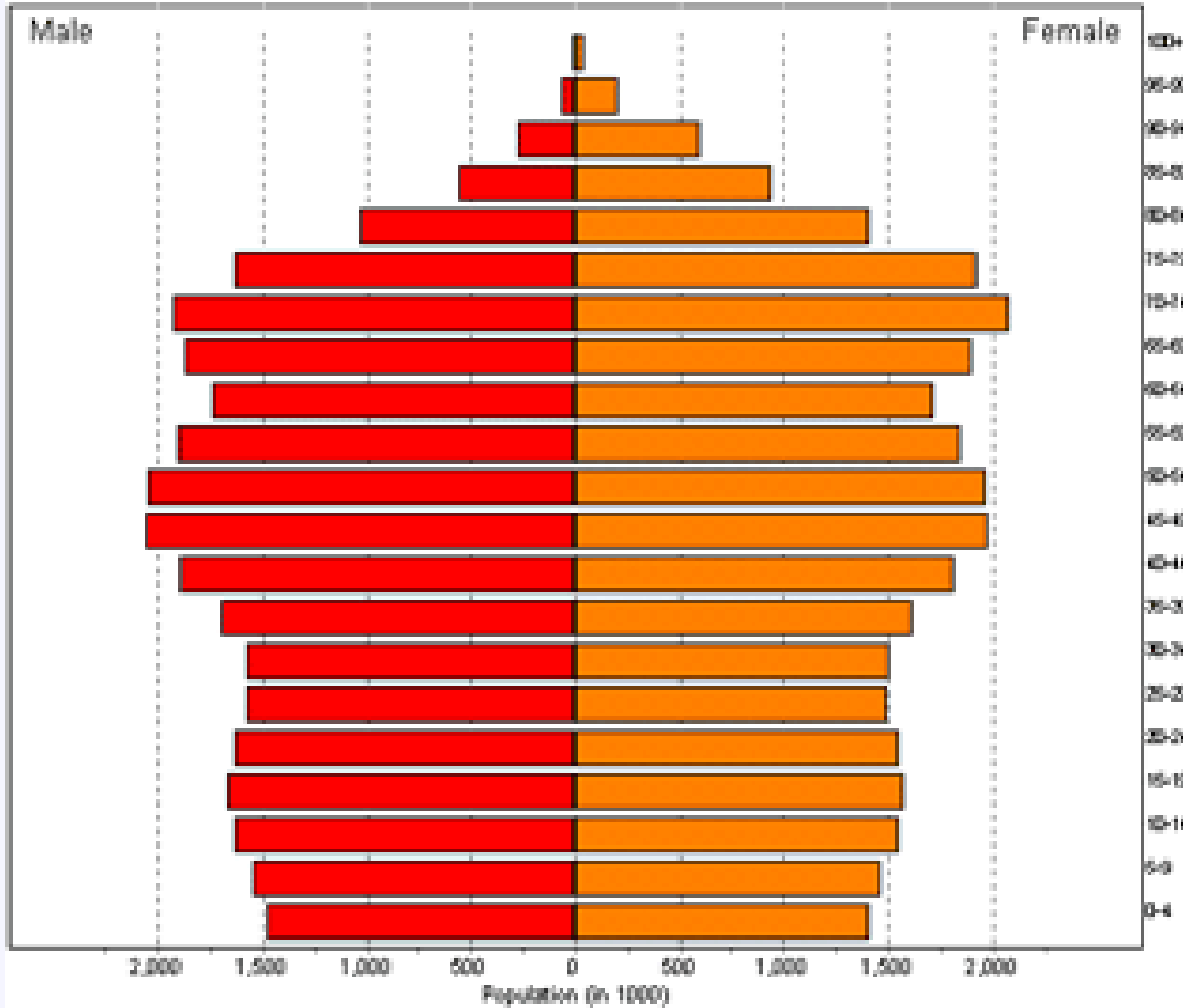
United Kingdom
Medium Variant

2035



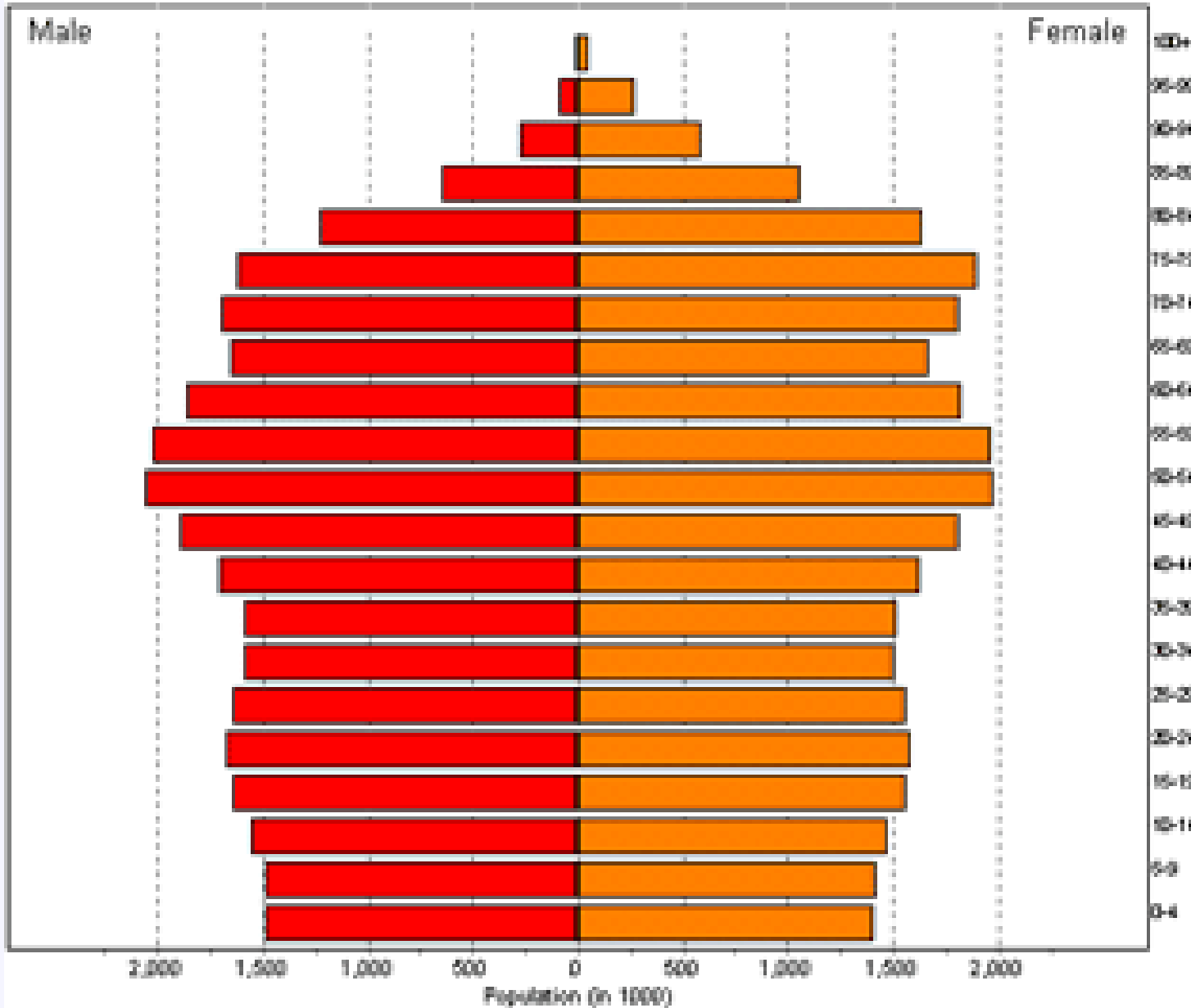
United Kingdom
Medium Variant

2040



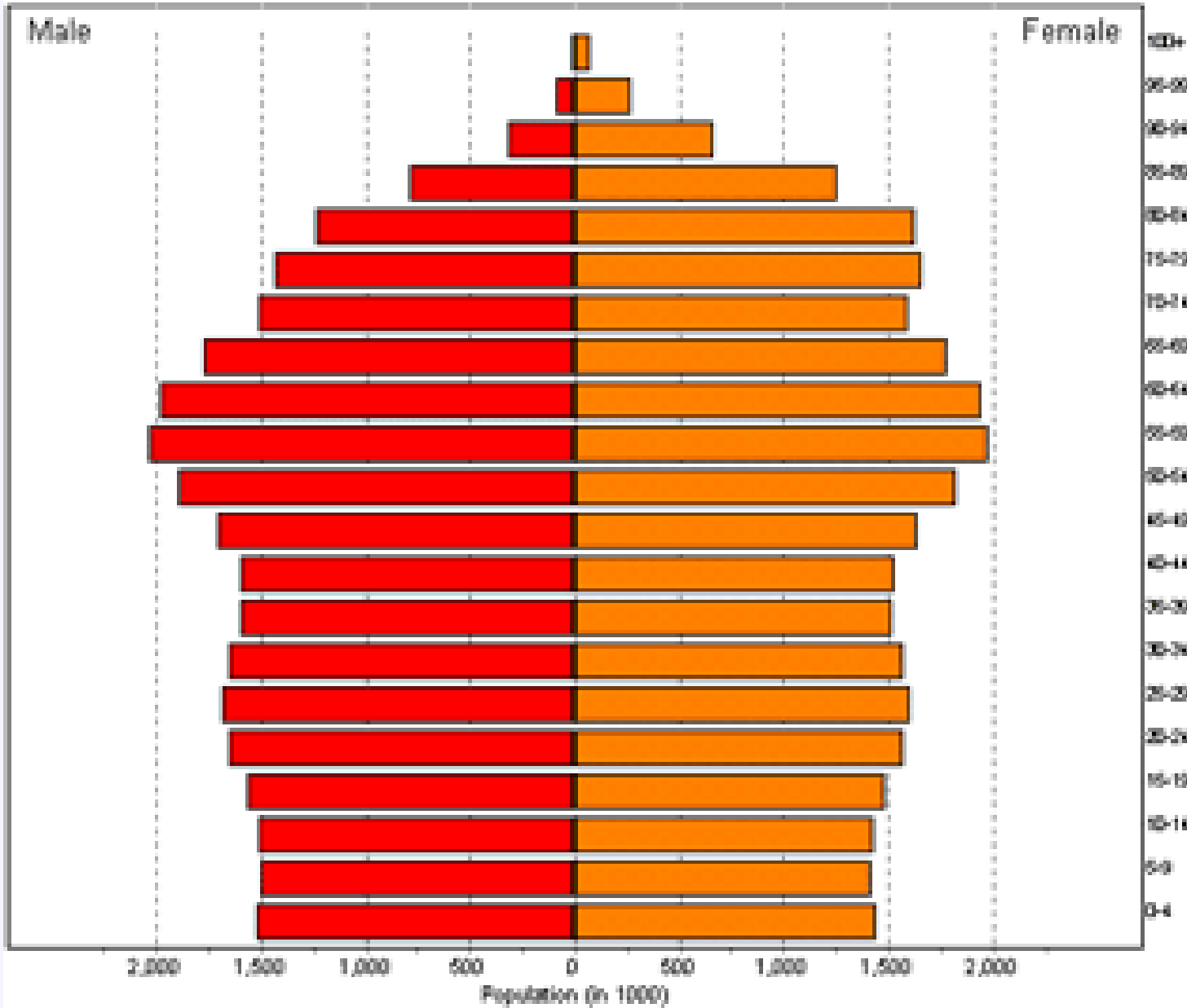
United Kingdom
Medium Variant

2045



United Kingdom
Medium Variant

2050



Doom's Day Recap

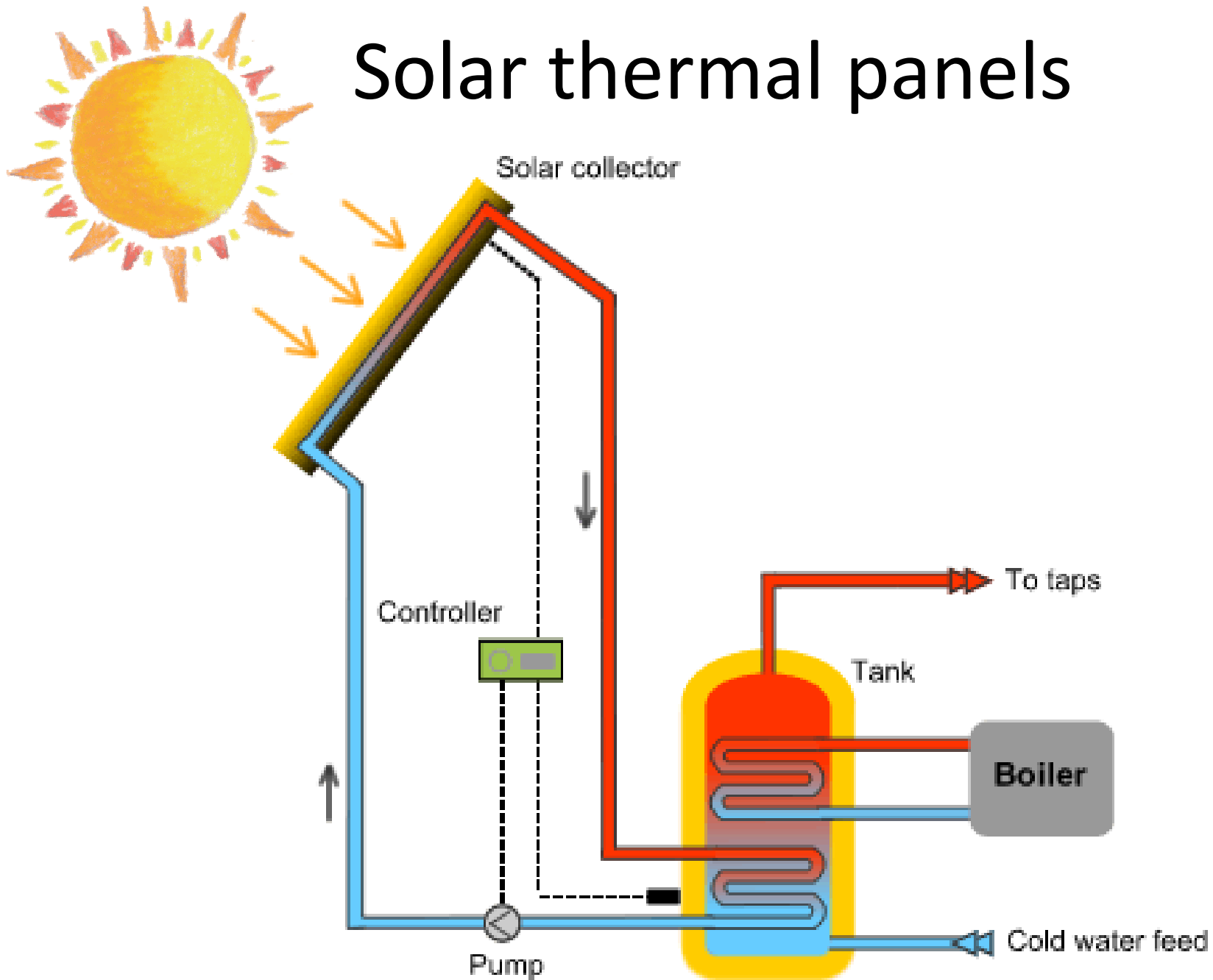
- We have a **massively** expanding global population
- We have a dependency on **energy** in many forms
- We are running out of **fossil fuels**
- **Climate Change** is happening



Solar thermal panels

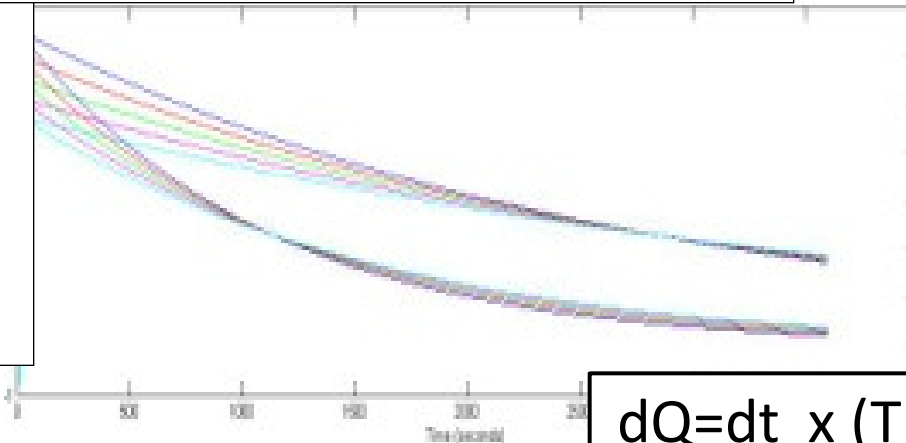
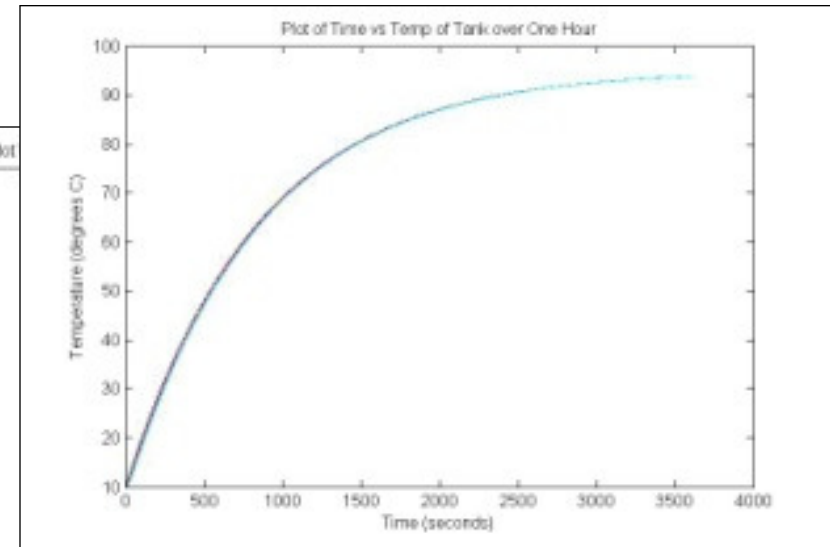
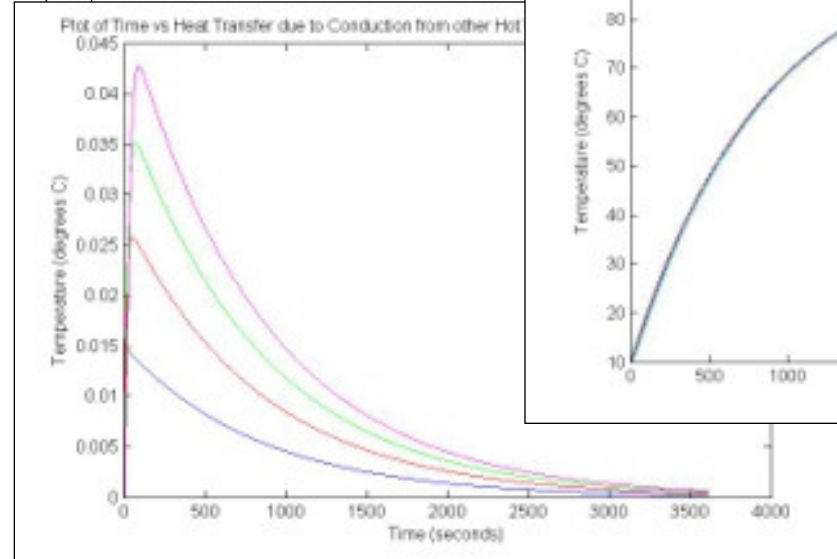
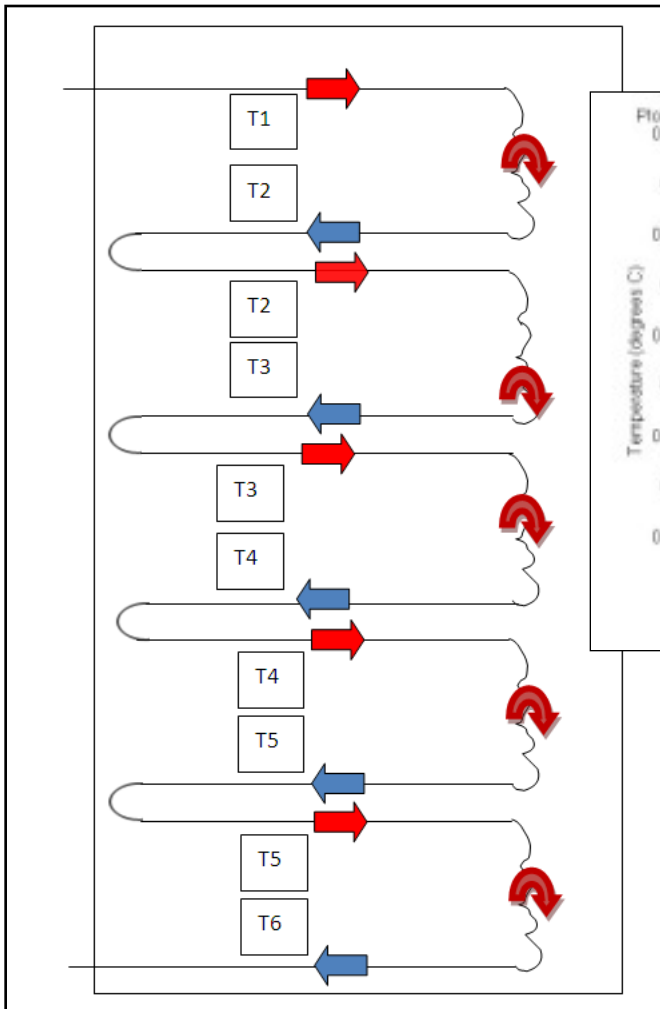


Solar thermal panels





Mechanical Engineering

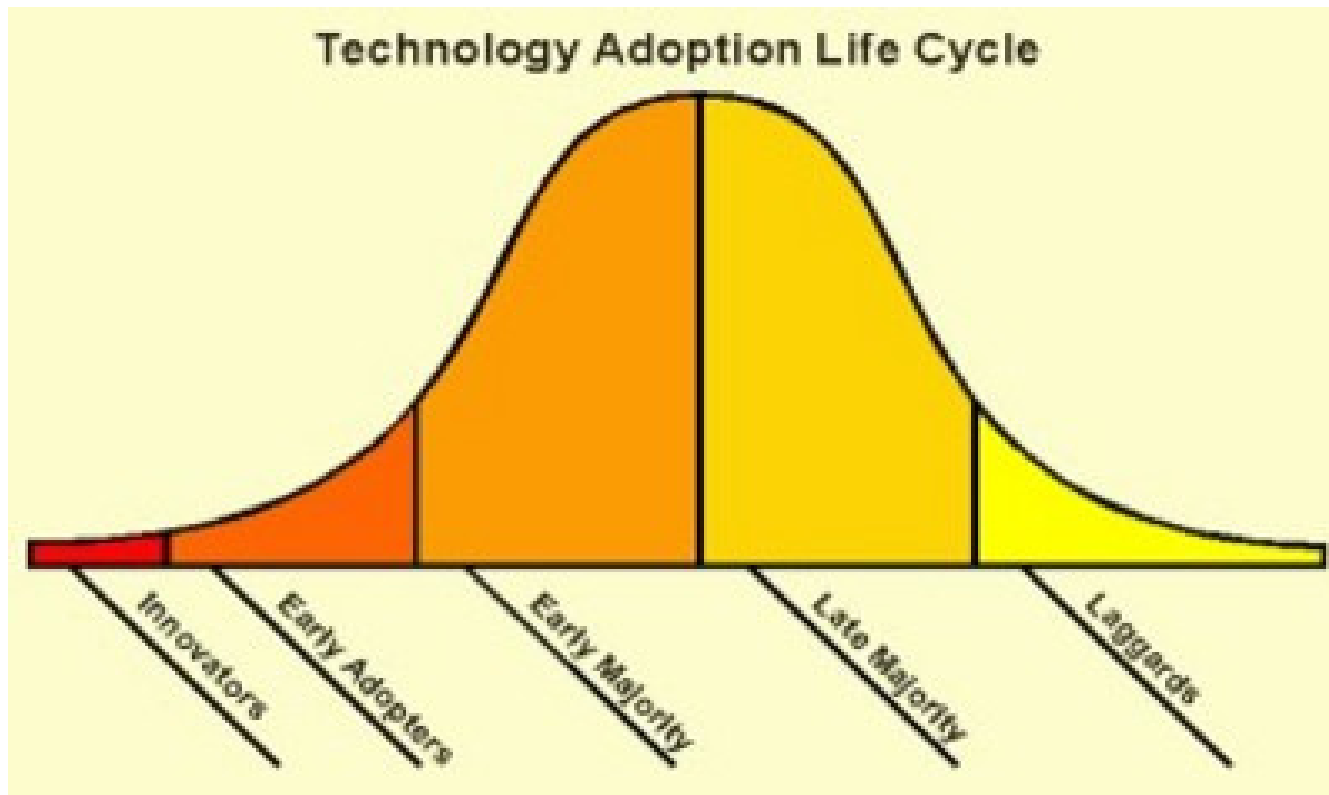


$$dQ=dt \times (T1-T2) \times U \times A$$



My work so far in psychology

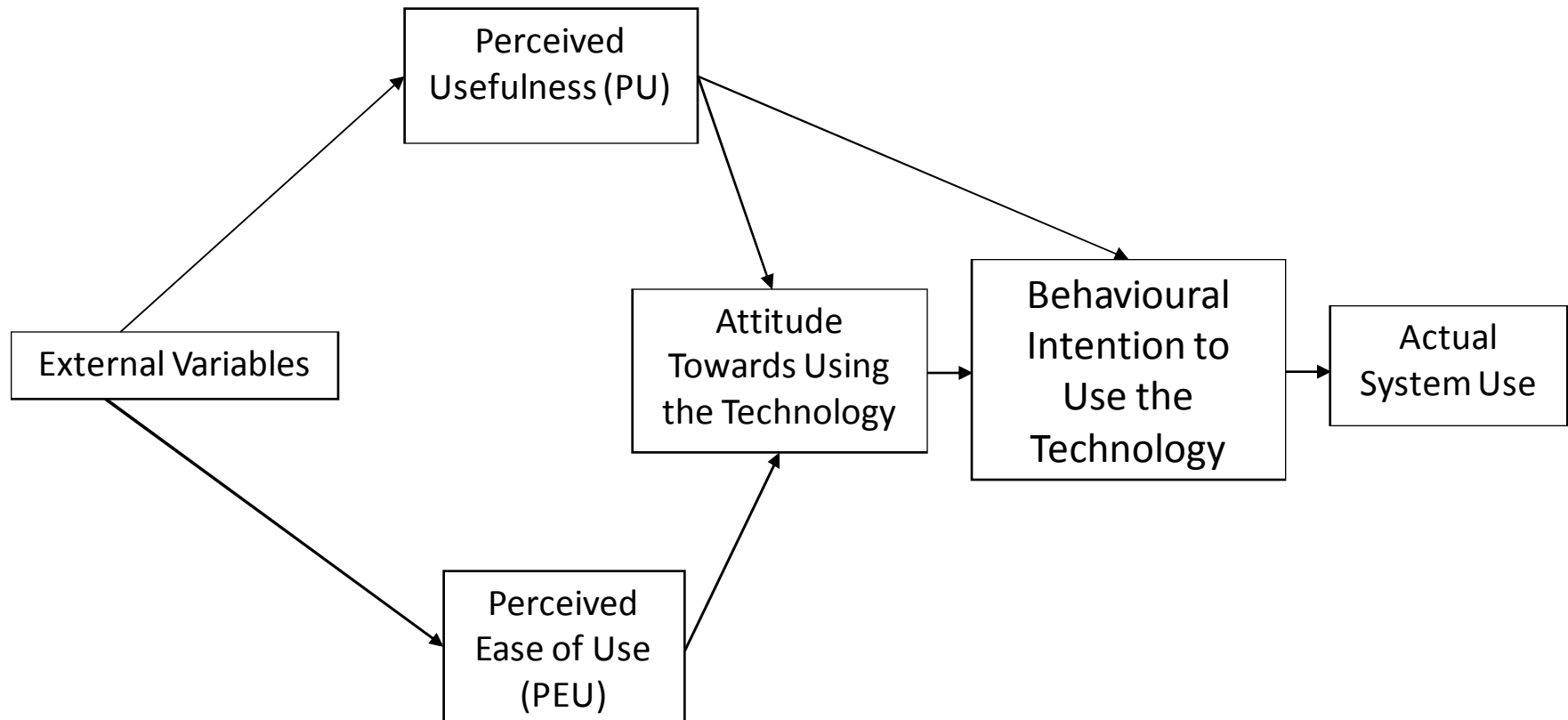
- Assessing various models that predict consumer behaviour to adoption of technologies;
- TAM, TALC, MATH, Diffusion of Innovations etc





Psychology

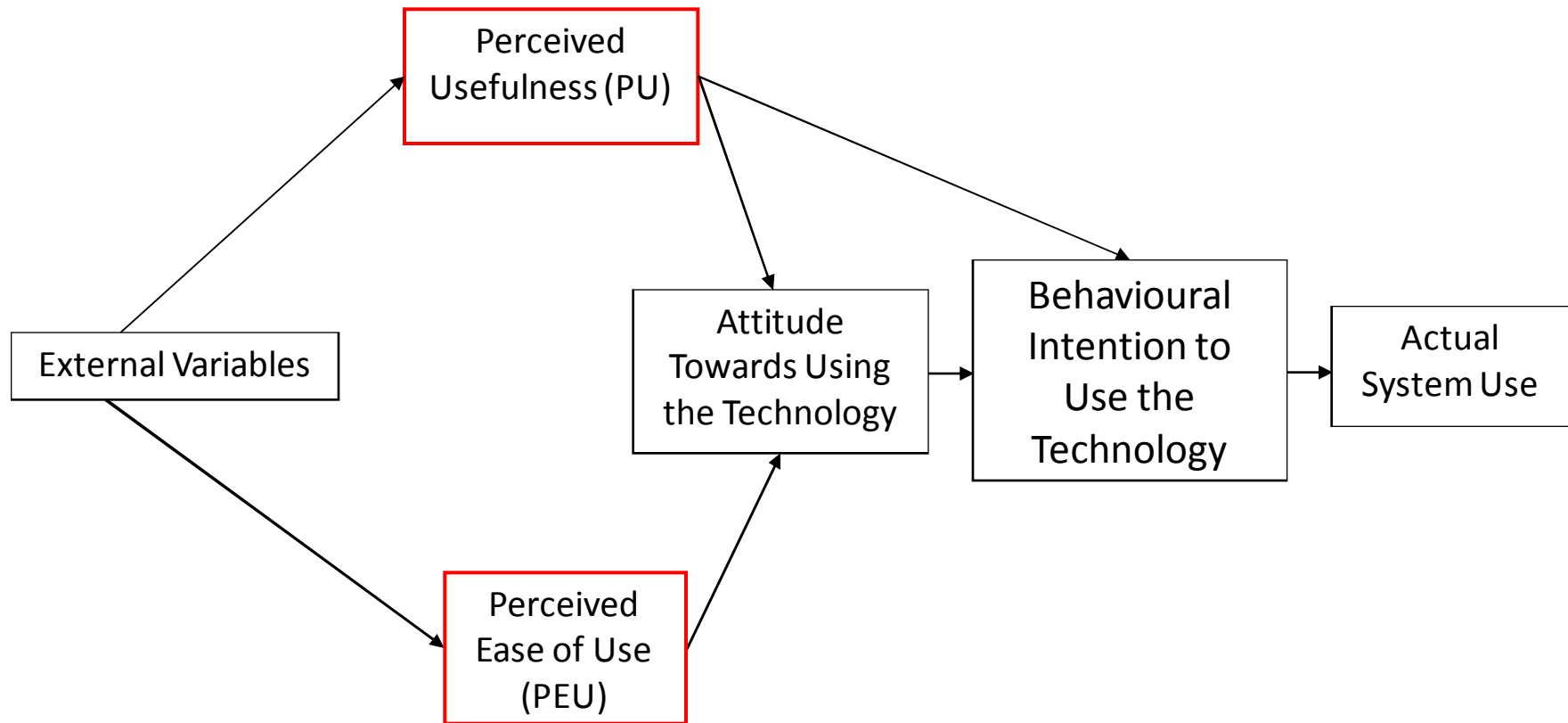
Technology Acceptance Model (TAM)





Psychology

Technology Acceptance Model (TAM)





Implications

- A more suitable design of system to consumer categories
 - Increase in adoption rate;
 - Increase in efficiency;
 - Modify behaviour.
- A better understanding of consumer behaviour across countries



Future Work

- Conducting Focus Groups and Questionnaires that question aspects of the TAM
- Designing a solar thermal system that appeals to different consumer categories and thus will have a high adoption rate
- Designing a user interface which promotes appropriate behaviour
- Repeating questionnaire in Greece for a European comparison



E-Futures



The University Of Sheffield.

Research Councils UK
Energy
For a Low Carb

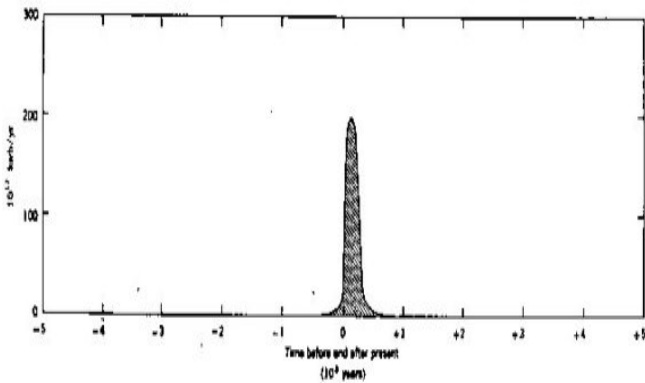
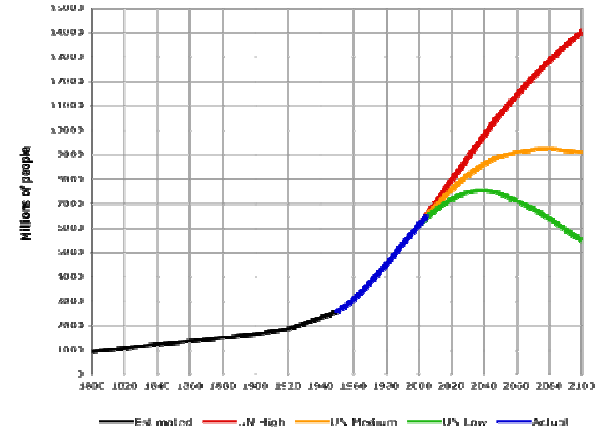
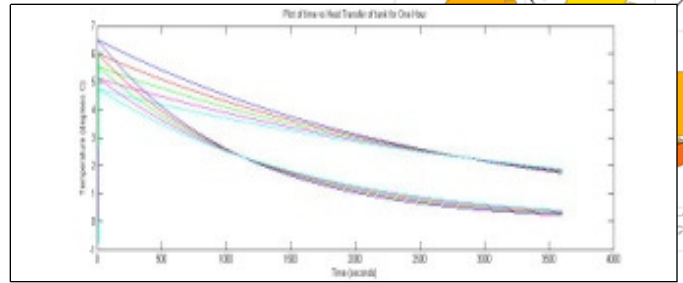
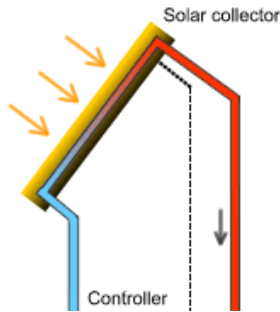
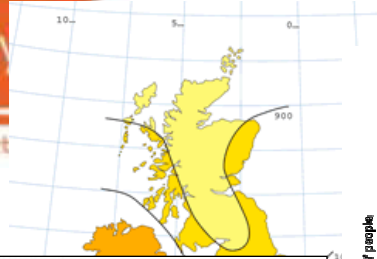


Fig. 10 - Epoch of fossil-fuel exploitation in human history during the period from 5,000 years ago to 5,000 years in the future (Hubbert, 1974a, fig. 69).

Global Warming Predictions

