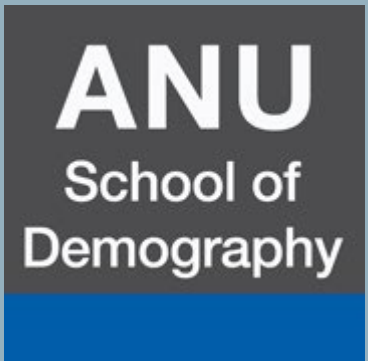We acknowledge and celebrate the First Australians on whose traditional lands we meet, and pay our respect to the elders past and present.

POPULATION ANALYSIS

Vladimir Canudas-Romo

School of Demography

Research School of Social Sciences

Phd

Univ. Groningen, NLD

Max-Planck Institute, DEU

Researcher

Penn State, USA

UC, Berkeley, USA

Faculty

Johns Hopkins University, USA

MaxO, DNK

ANU, AUS

- 3 hours per week

    - A demographic question?

    - Learn methods

    - computer lab – R

- Facilitation of **YOUR LEARNING**

- **ACTIVE** participation is highly recommended

- Preparatory readings and R-activities will increase learning
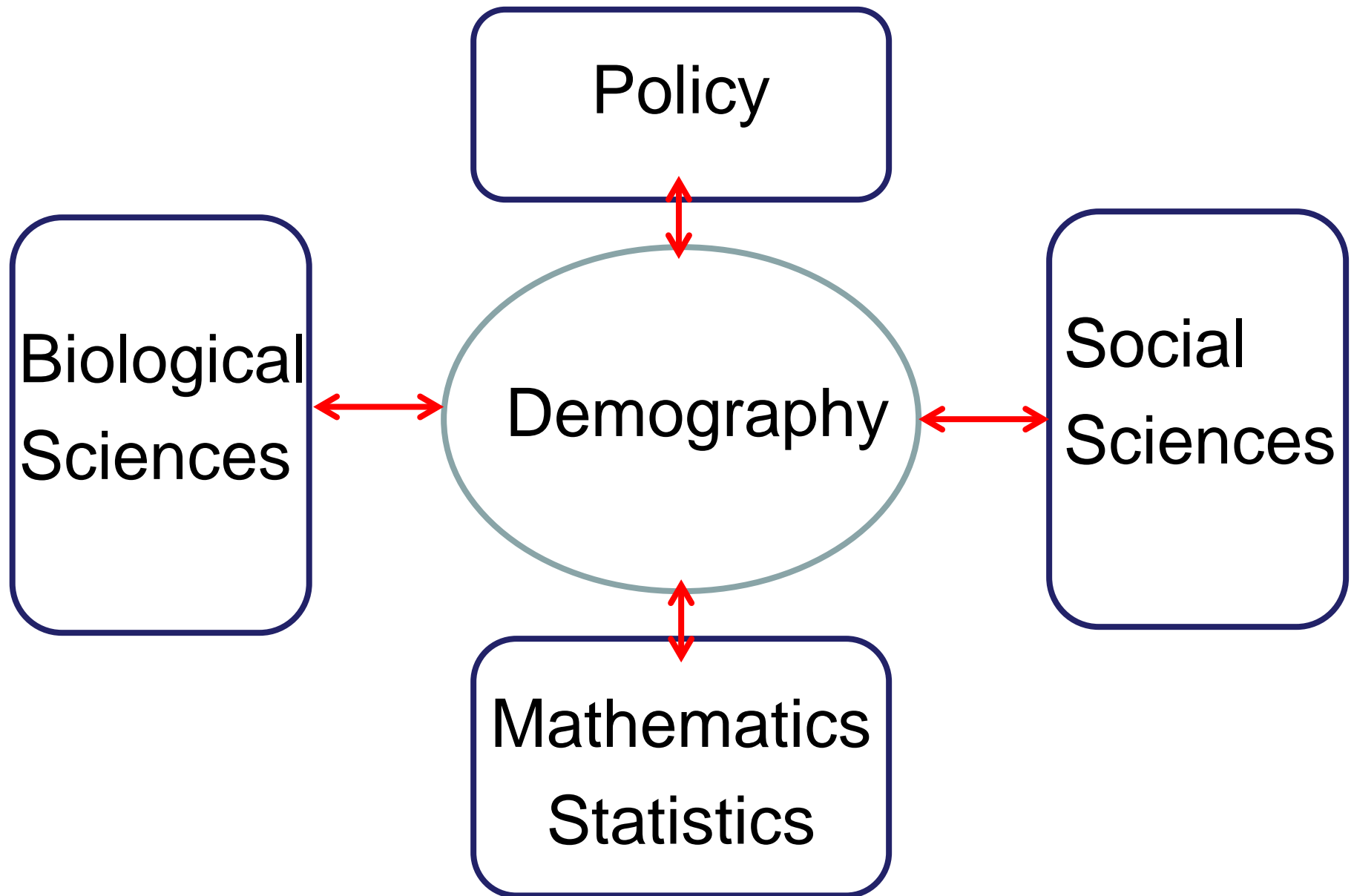
1. Demographic change

2. Demographic measures: Fertility, mortality

& migration

3. Analyse demographic data: R &

databases

Biological
Sciences

Demography

Social
Sciences

Mathematics
Statistics

course materials

Australian National University

Week/ Session	Date	Topic	Reading material (Preston et al. book, P) (Population Analysis www, PA)	Assessment
1	20/Feb	Introduction	P chapter 1; PA section 1,2	
2		Fertility I	P 2,5; PA 4,5	
3		Fertility II	P 5; PA 4,5	
4		Mortality I	P 3; PA 6-8	
5		Mortality II	P 3; PA 6-8	
6	27/Mar	Migration	PA 9	
	ANU break			
7	17/Apr	**MID-TERM EXAM**		
8		Population Growth	P 2; PA 3	
9		Forecasting	PA 10	
10		Forecasting		
11	15/May	Population Health Family Formation	P 3 wattle material	
12	22/May	**FINAL EXAM**		

- **Preston SH, Heuveline P and Guillot M** (2001) *Demography: Measuring and Modeling Population Processes*. Oxford: Blackwell.

- IUSSP: **Population Analysis for Policies & Programmes** (http://papp.iussp.org/index.html)

Free software

https://www.r-project.org/

https://www.rstudio.com/

You can learn more about R at

https://www.youtube.com/c/rprogramming101

Assessment

Assessment

Assessment Task	Value	Due Date	Date for Return of Assessment
1. midterm exam	(33%)	17/April	2 weeks after
2. Final exam	(33%)	22/May	
3. participation	(34%)		

Midterm exam Demo2002 "Population Analysis"

Name: _____.

ANU u-ID: _____.

1) Fertility: In Wattle you can find the age-specific fertility rates by birth order for the USA (from the file "USA.txt").

1.a) Present <u>one</u> plot including the USA age-specific fertility rates and describe ....

1.d) Present <u>a Table</u> including TFR, and the Mean Age at Childbearing (MAC), and describe ...

Weekly assessment:

Details of task: ONE page including a plot from an assigned topic and a brief description.

Assessment Rubrics

Presentation requirements: One page including a plot similar to the exercise made in class in R, but with a different country and a short description of the result.
Individual Assessment.

- **Turnitin**

- Extensions and late submission (5% rate) of assessment pieces are covered by the Student Assessment (Coursework) Policy and Procedure.

Feedback

Students will be given feedback in the following forms:

- Written comments on assignments
- Class and individual feedback during all computer-based learning activities in class
- Class feedback via verbal comments

- Student Experience of Learning Support (SELS) surveys.

  Anonymous feedback at end of course
  http://unistats.anu.edu.au/surveys/selt/students/

- Early and ongoing opportunities for anonymous feedback through online forum.

- **PLEASE PROVIDE FEEDBACK**

Class representatives… ?

Receiving times: Consultation by appointment

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POPULATION CHANGE

School of Demography

Research School of Social Sciences

	Pt2	Pt1	Bt1_t2	Dt1_t2	Mt1_t2
Country1	?	22,930,591	303,266	148,222	216,874
Country2	?	125,897,863	1,030,251	1,269,404	26,050
Country3	?	143,346,675	1,895,822	1,871,809	301,724

Population at time 2?
Which country?

POPULATION CHANGE

	Pt2	Pt1	Bt1_t2	Dt1_t2	Mt1_t2
Country1	**23,302,509**	22,930,591	303,266	148,222	216,874
Country2	**125,684,760**	125,897,863	1,030,251	1,269,404	26,050
Country3	**143,672,412**	143,346,675	1,895,822	1,871,809	301,724

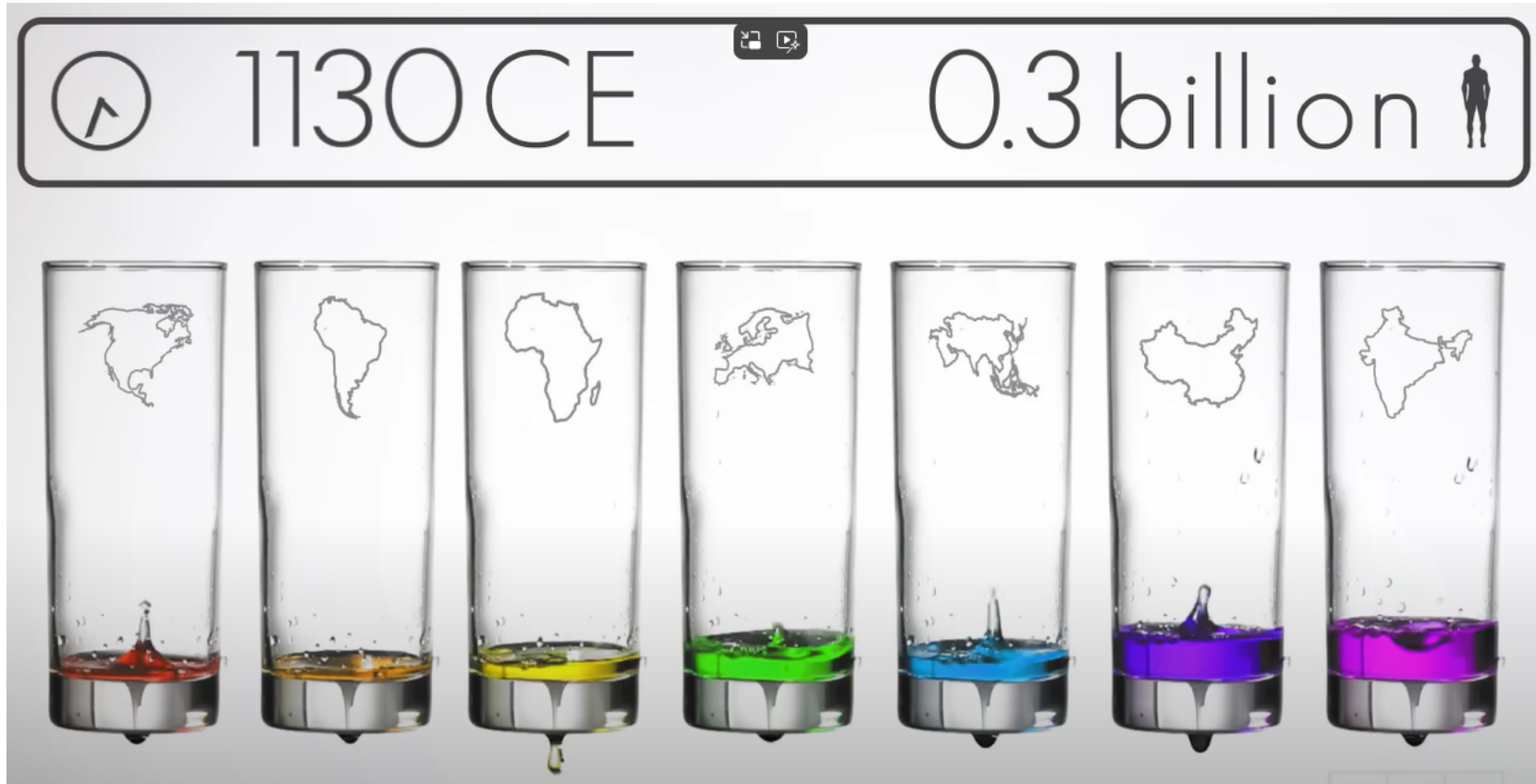$$P_{t2} = P_{t1} + B - D + M$$

Population at a later time
= Initial population + entries - exits

POPULATION CHANGE

	Pt2	Pt1	Bt1_t2	Dt1_t2	Mt1_t2
Australia	**23,302,509**	22,930,591	303,266	148,222	216,874
Japan	**125,684,760**	125,897,863	1,030,251	1,269,404	26,050
Russia	**143,672,412**	143,346,675	1,895,822	1,871,809	301,724

Balance Equation

POPULATION CHANGE

	Pt2	Pt1	Bt1_t2	Dt1_t2	Mt1_t2
Australia	**23,302,509**	22,930,591	303,266	148,222	216,874
Japan	**125,684,760**	125,897,863	1,030,251	1,269,404	26,050
Russia	**143,672,412**	143,346,675	1,895,822	1,871,809	301,724

$$P_{t2} = P_{t1} + B - D + M$$

Population at a later time

= Initial population + entries - exits

$$P_{t2} - P_{t1} = \text{Population Change}$$

$$P_{t2} - P_{t1} = \text{Population Change}$$

$$\frac{P_{t2} + P_{t1}}{2} = PY$$

Mid-year population

$$P_{t2} = P_{t1} + B - D + M$$

Population at a later time

      = Initial population + entries - exits

$$\frac{P_{t2} - P_{t1}}{PY} = \frac{B}{PY} - \frac{D}{PY} + \frac{M}{PY}$$

$$r = b - d + m$$

Population growth =

                           Crude birth rate

              -     Crude death rate

              +   Net migration rate

POPULATION CHANGE

	Pt2	Pt1	Bt1_t2	Dt1_t2	Mt1_t2
Australia	**23,302,509**	22,930,591	303,266	148,222	216,874
Japan	**125,684,760**	125,897,863	1,030,251	1,269,404	26,050
Russia	**143,672,412**	143,346,675	1,895,822	1,871,809	301,724

	PY	r	b	d	m
Australia	23116550	1.61	1.31	0.64	0.94
Japan	125791311.5	-0.17	0.82	1.01	0.02
Russia	143509543.5	0.23	1.32	1.30	0.21

Preston et al. book, Chapter 1

Population Analysis www,
Section 1,2

Joel Cohen

Why should you study demography?

https://www.youtube.com/watch?v=2vr44C_G0-o&feature=emb_logo