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# Modelling international migration in population projections by education

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# IIASA-VID multi-state cohort-component projections by education: The road so far



- 120 countries (150 in 2011)
- four levels of educational attainment based on ISCED

no education	primary (ISCED 1)	secondary (ISCED 2-4)	tertiary (ISCED 5,6)
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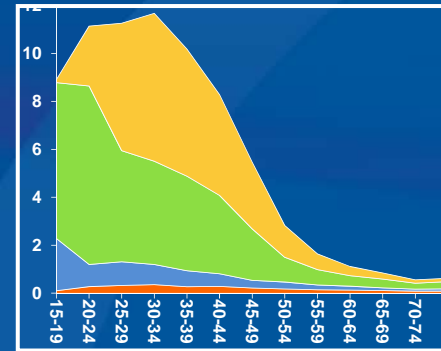
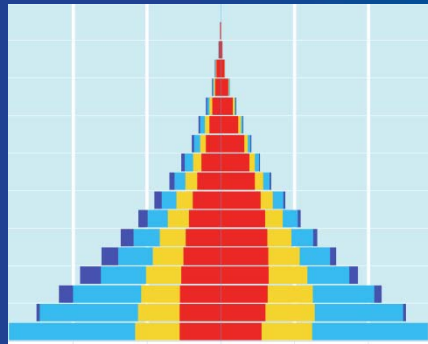
- differentials in **fertility** and **mortality** by education
- estimation of **net migration** using the residual method
  - net migration = difference in the population structure between UN and IIASA projections (i.e. IIASA > UN = net migration gain)



# IIASA-VID multi-state cohort-component projections by education: modelling migration

- countries with net migration **losses** (sending): random migrant assumption

Population in country i



Net losses from country i

global migrant pool

- countries with net migration **gains** (receiving): education profile to a receiving country is representative of the pool



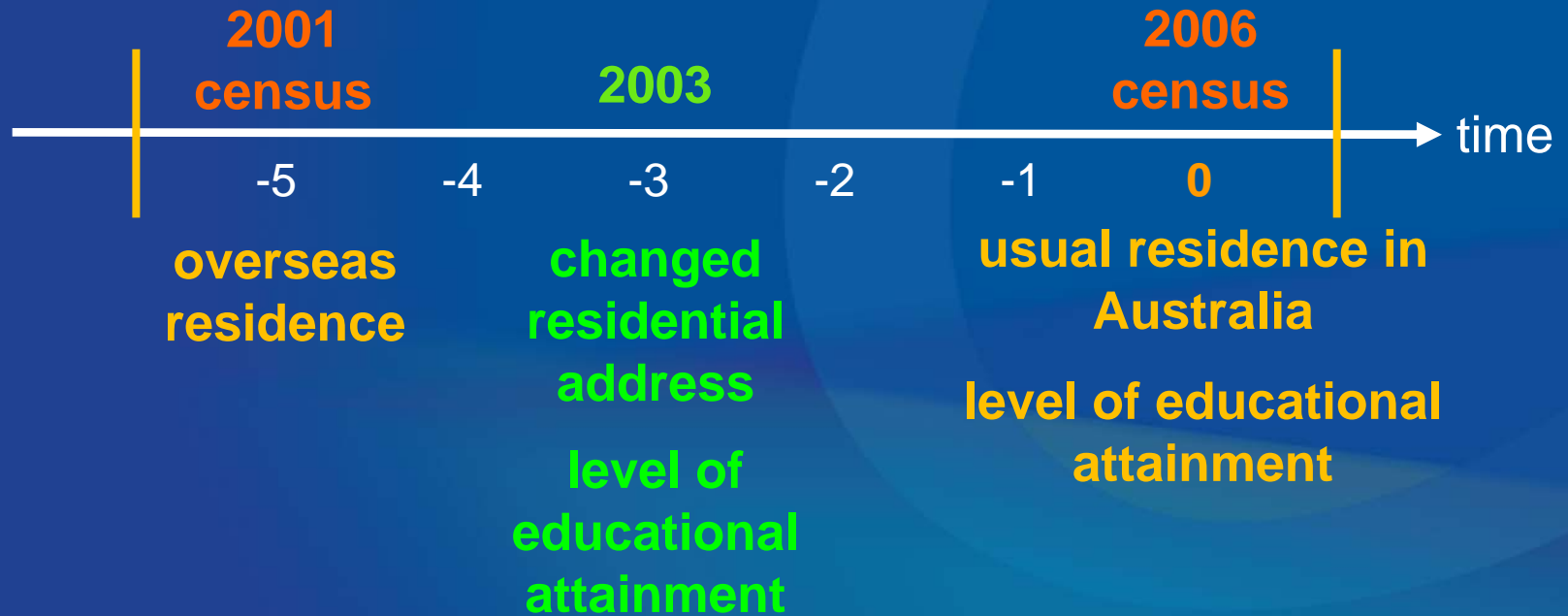
## Multi-state cohort-component projections by education: limitations of the current approach

- estimated **net-migration** rates and a global migrant **pool**
- **out- migrants'** educational structure is representative of the origin population
- **pool breaks link** between origin and destination countries
  - all outflows have the same education structure, irrespective of the destination
- **in-migrants'** educational structure is the same across all receiving countries
- room for **improving** the modelling of migration!



# Improving the modelling of migration: data sources

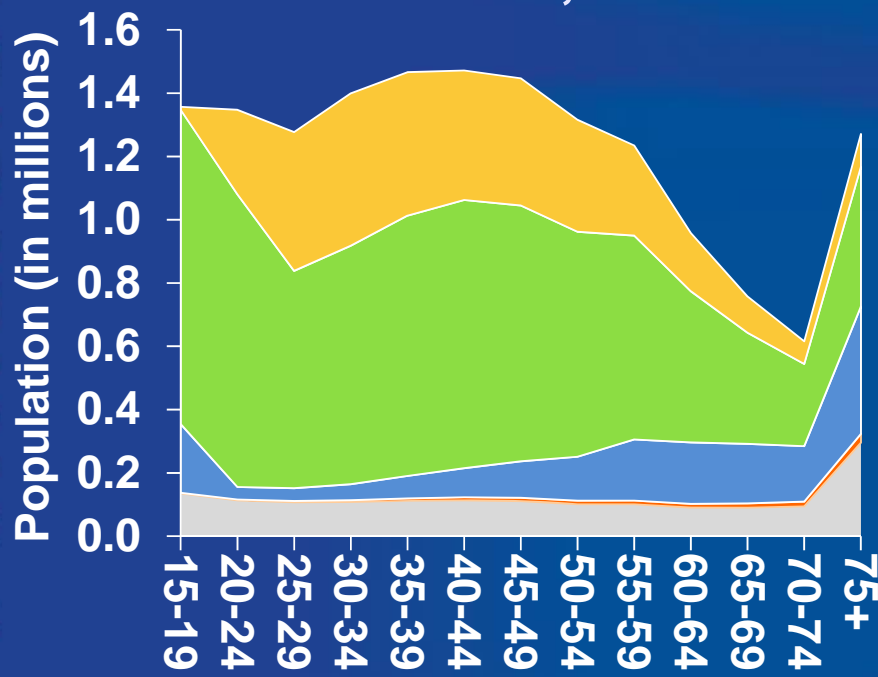
- **Census**
  - transition data, education measured at time of census
- **Population register**
  - event data, education measured at time of move
- **Passenger surveys**



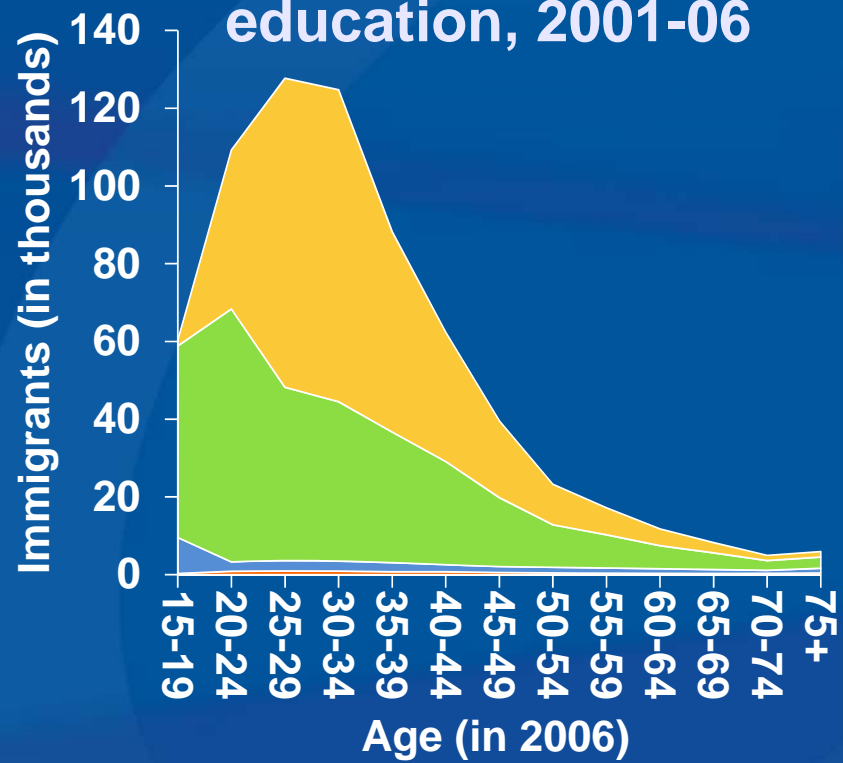


# Why we need to improve the modelling of migration: The example of Australia (2006 census)

### Australian population by education, 2006



### Immigration by education, 2001-06



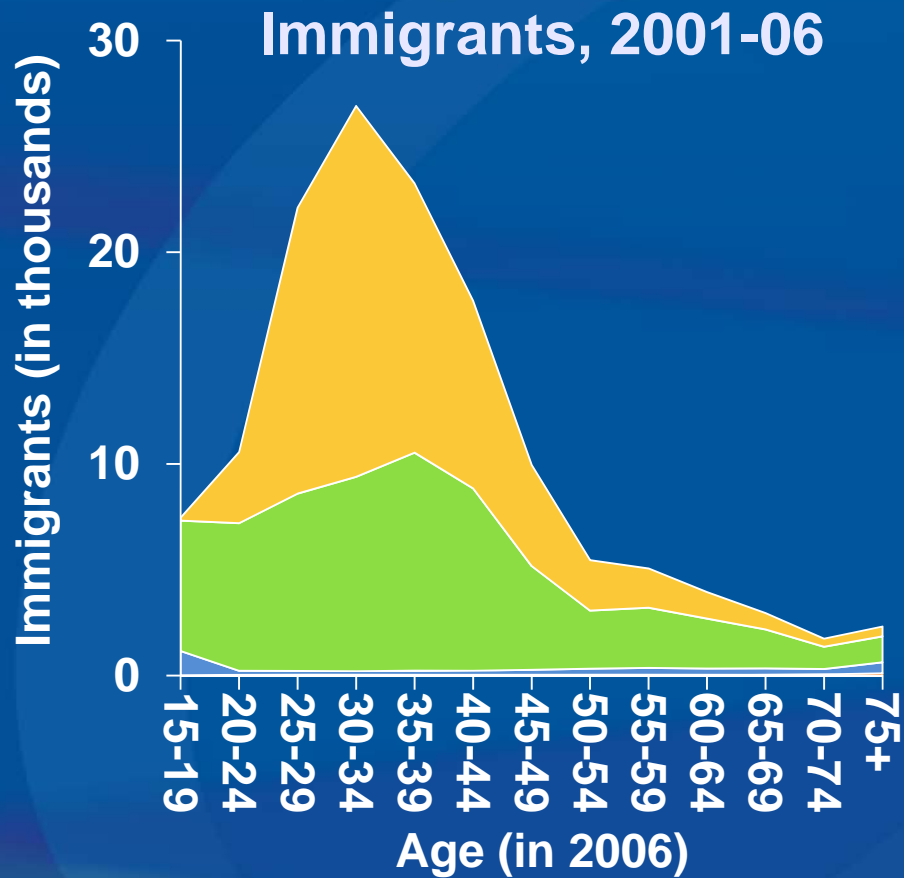
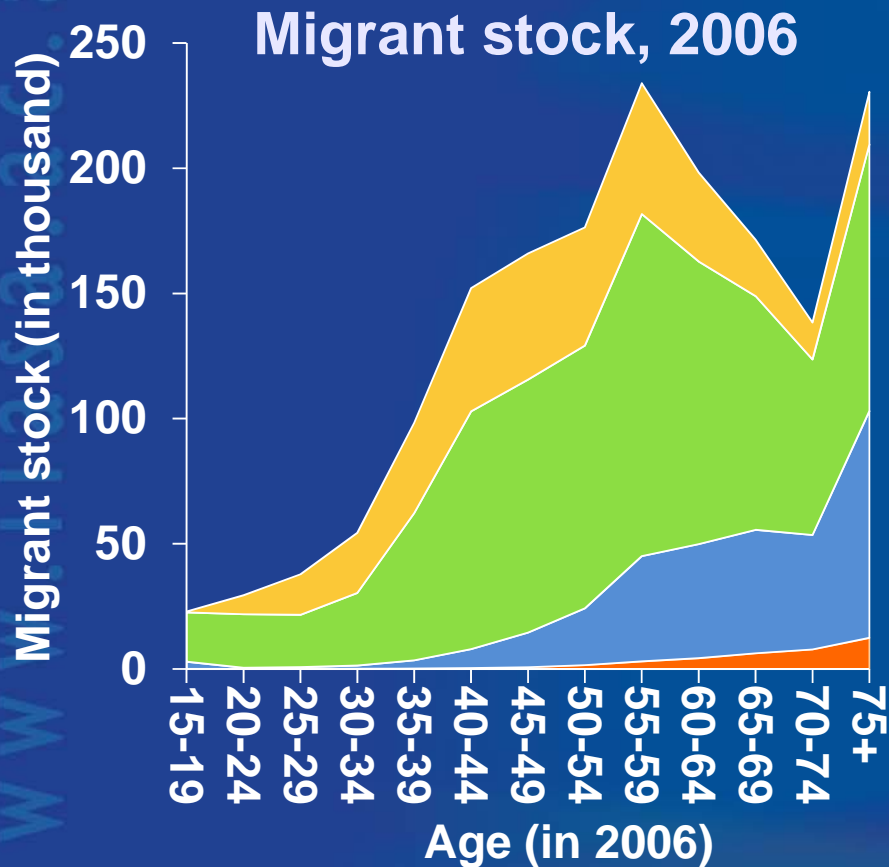
- tertiary (ISCED 5,6)
- secondary (ISCED 2, 4)
- primary (ISCED 1,2)
- no education (ISCED 0)
- not stated

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# Australia: Migrant stock and recent immigration of people born in Europe by education



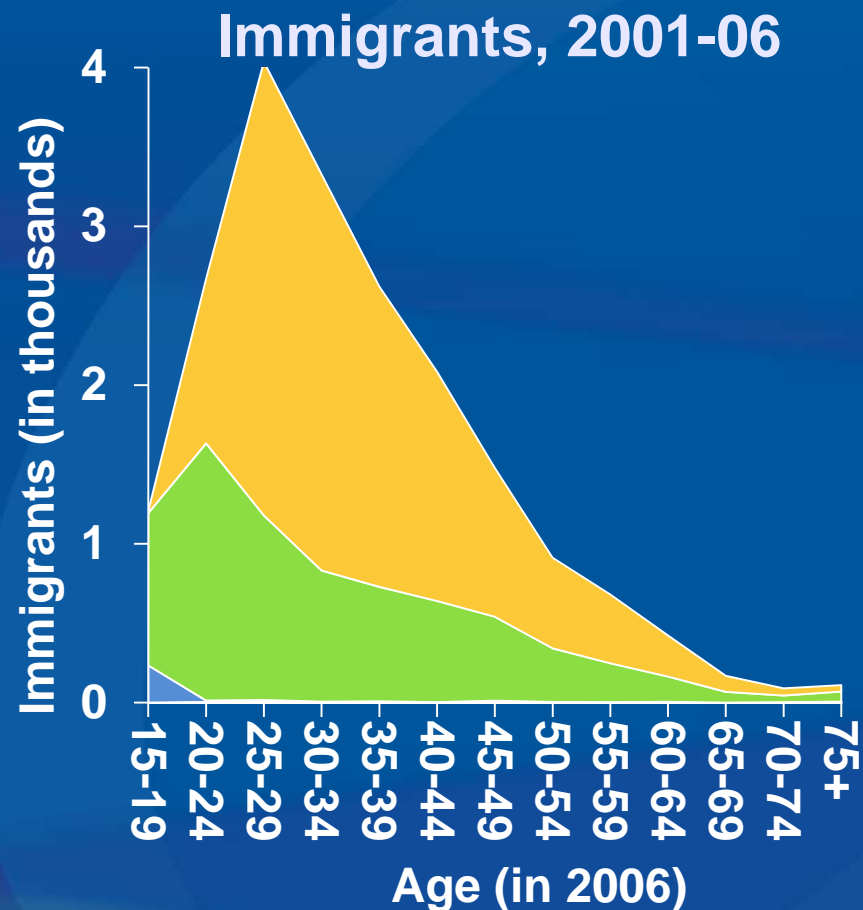
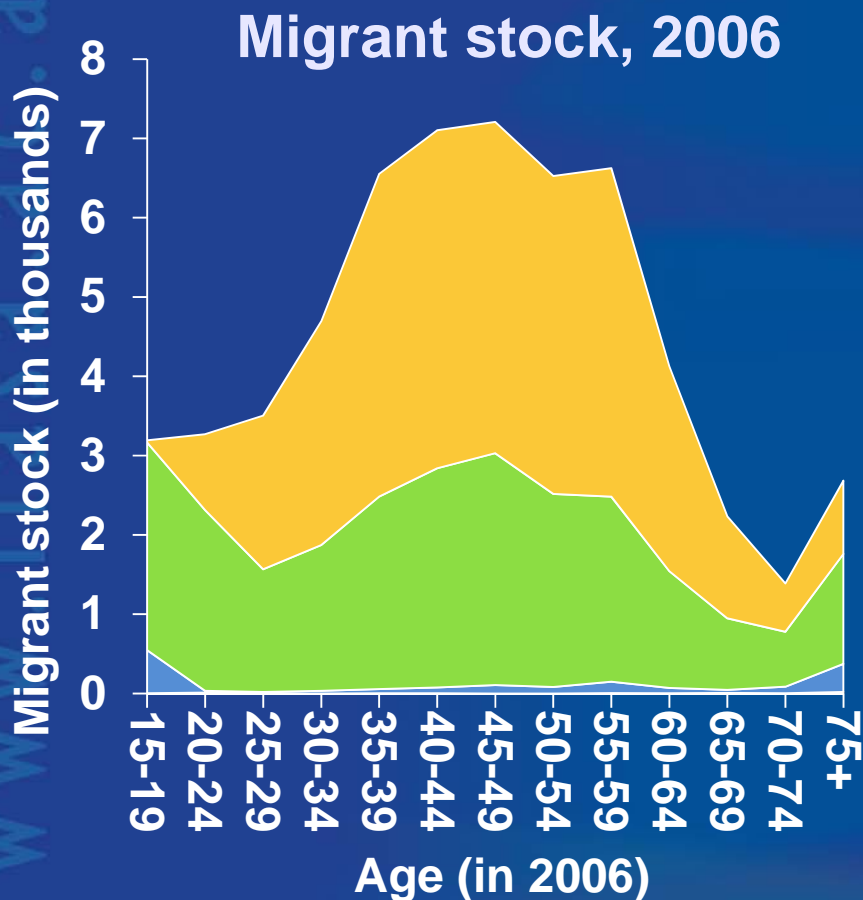
■ tertiary (ISCED 5,6)  
■ primary (ISCED 1,2)

■ secondary (ISCED 2, 4)  
■ no education (ISCED 0)





# Australia: Migrant stock and recent immigration of people born in North America by education



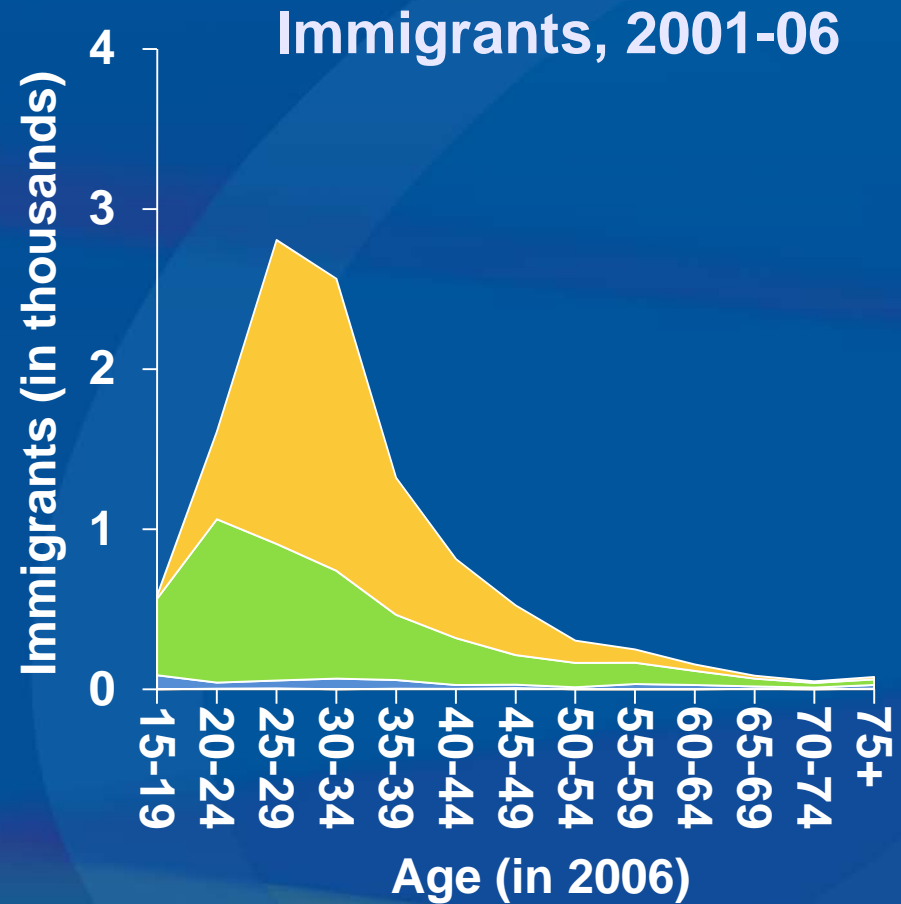
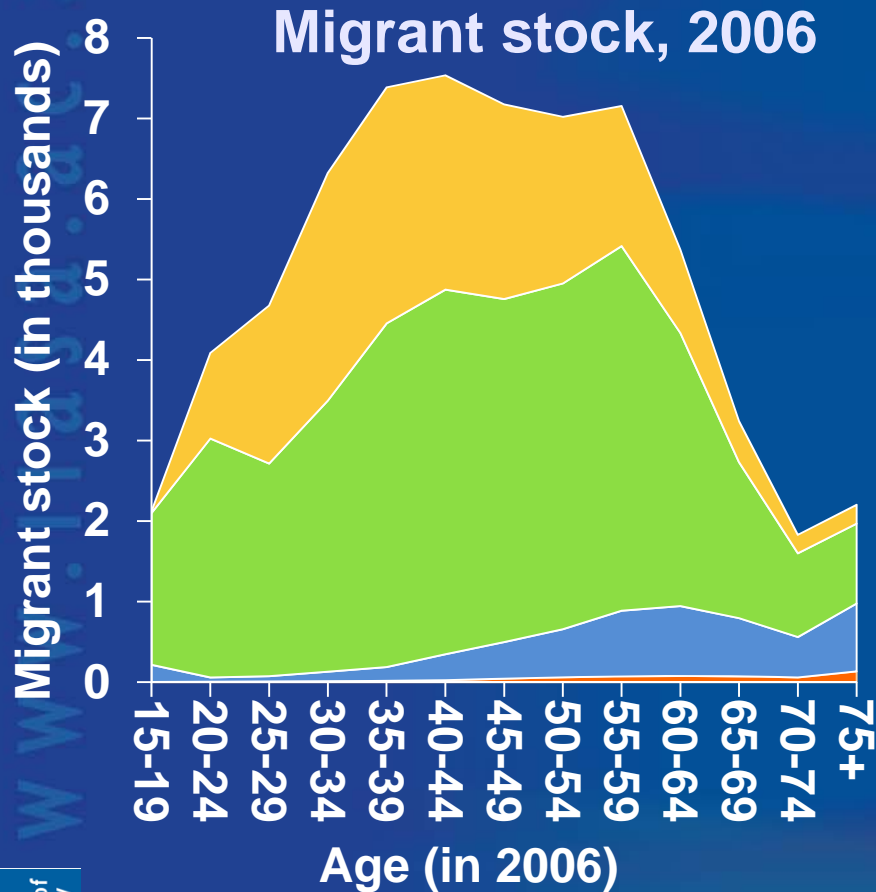
■ tertiary (ISCED 5,6)  
■ primary (ISCED 1,2)

■ secondary (ISCED 2, 4)  
■ no education (ISCED 0)





# Australia: Migrant stock and recent immigration of people born in Central & South America by education

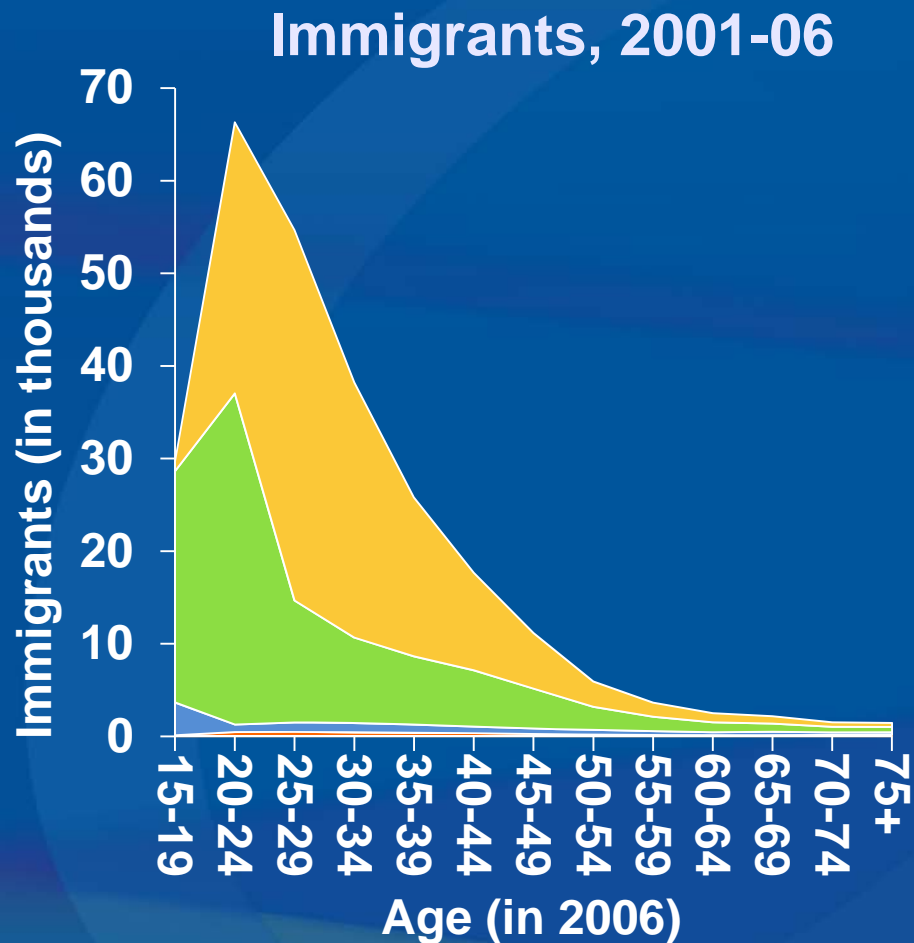
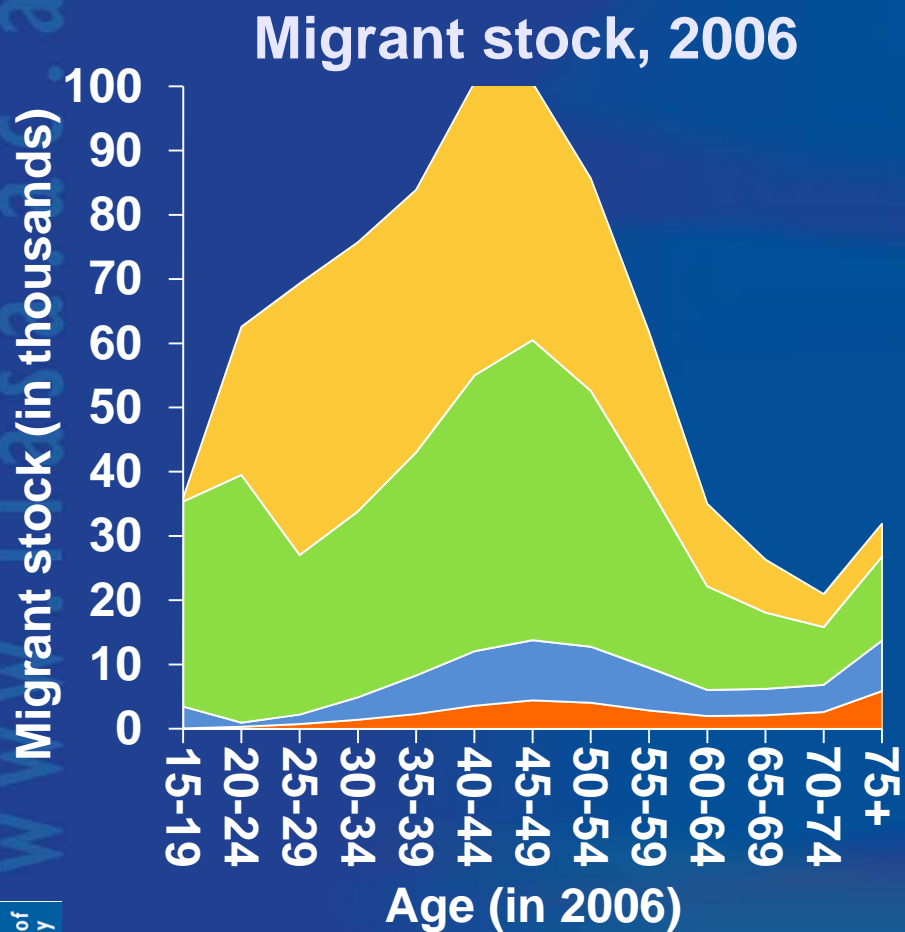


■ tertiary (ISCED 5,6)  
■ primary (ISCED 1,2)

■ secondary (ISCED 2, 4)  
■ no education (ISCED 0)



# Australia: Migrant stock and recent immigration of people born in Asia by education

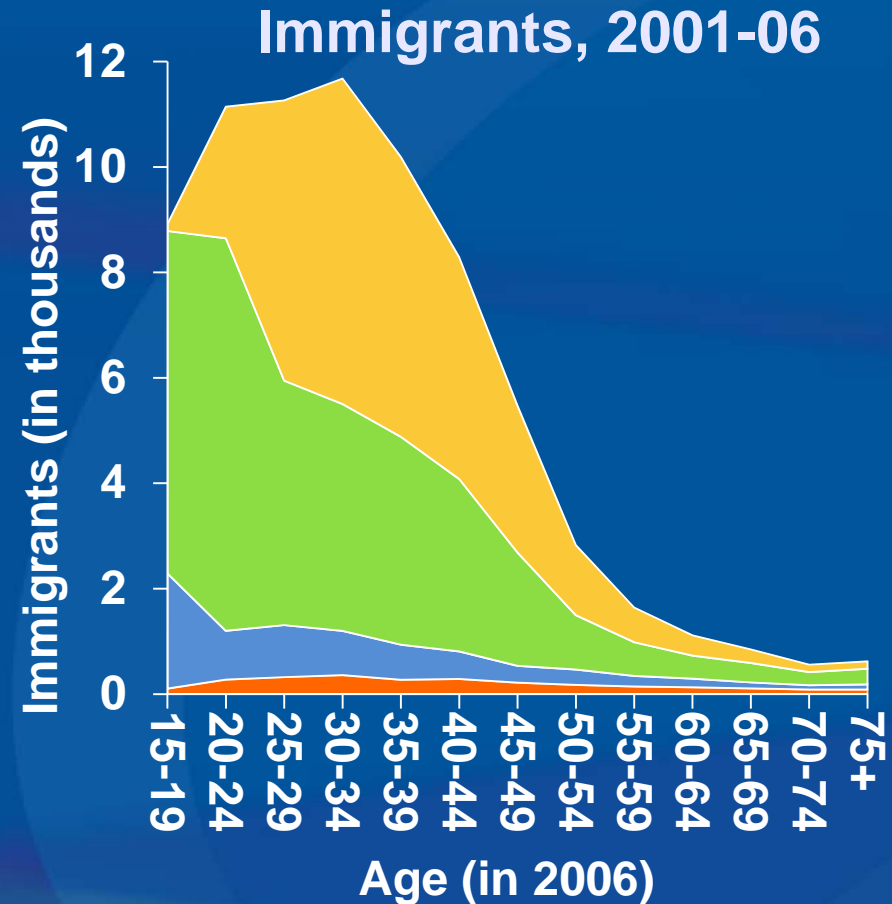
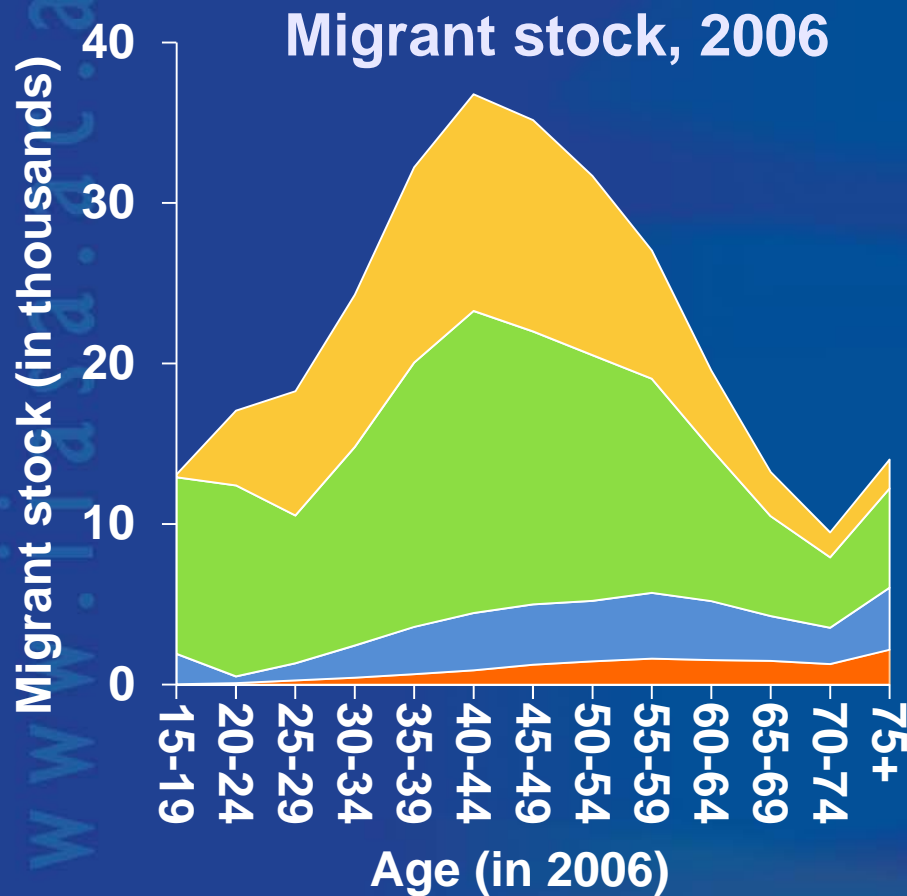


■ tertiary (ISCED 5,6)  
■ primary (ISCED 1,2)

■ secondary (ISCED 2, 4)  
■ no education (ISCED 0)



# Australia: Migrant stock and recent immigration of people born in Africa & the Middle East by education



■ tertiary (ISCED 5,6)  
■ primary (ISCED 1,2)

■ secondary (ISCED 2, 4)  
■ no education (ISCED 0)

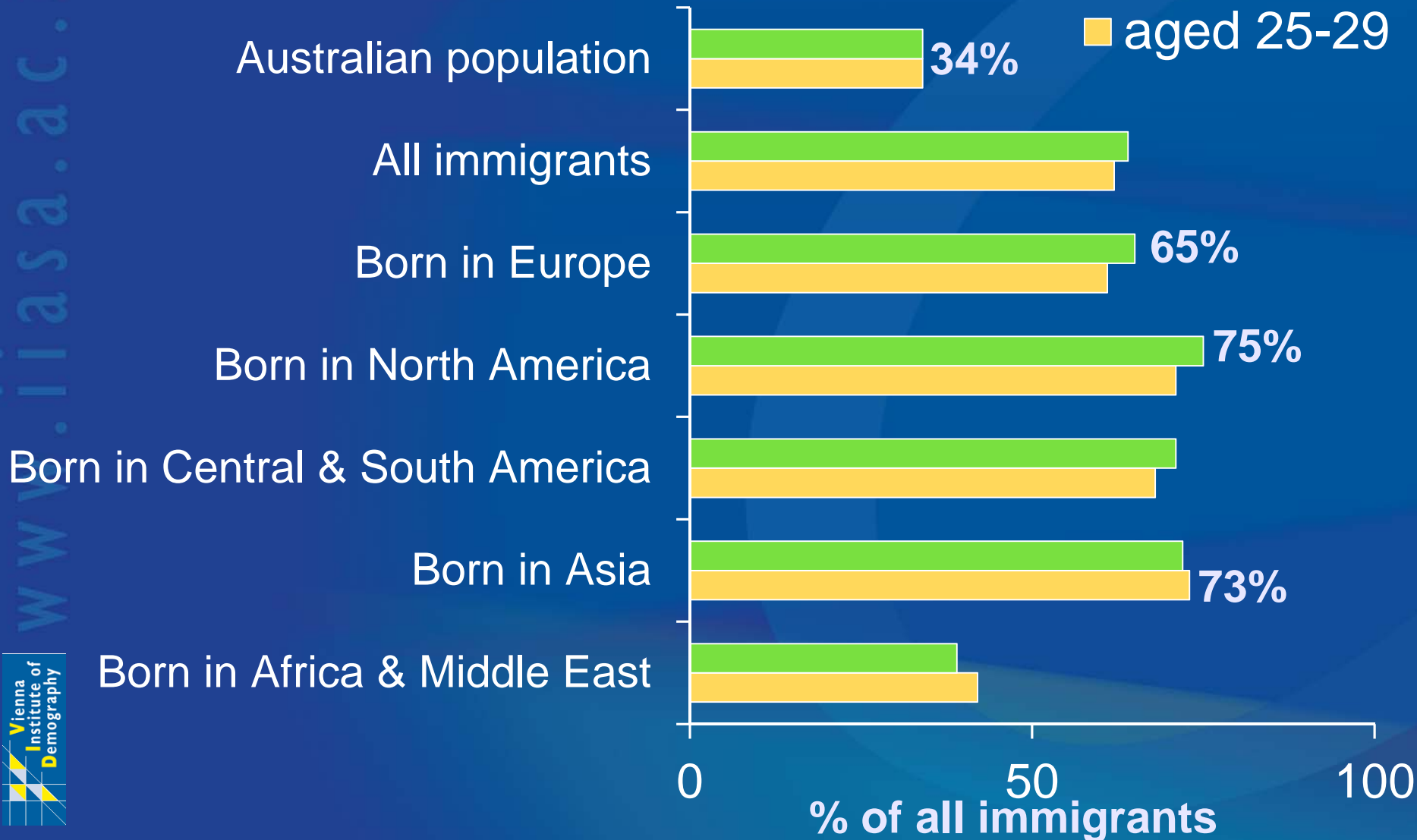


# Australia: per cent territory of the Australian population and of immigrants by region of birth

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aged 30-34  
aged 25-29

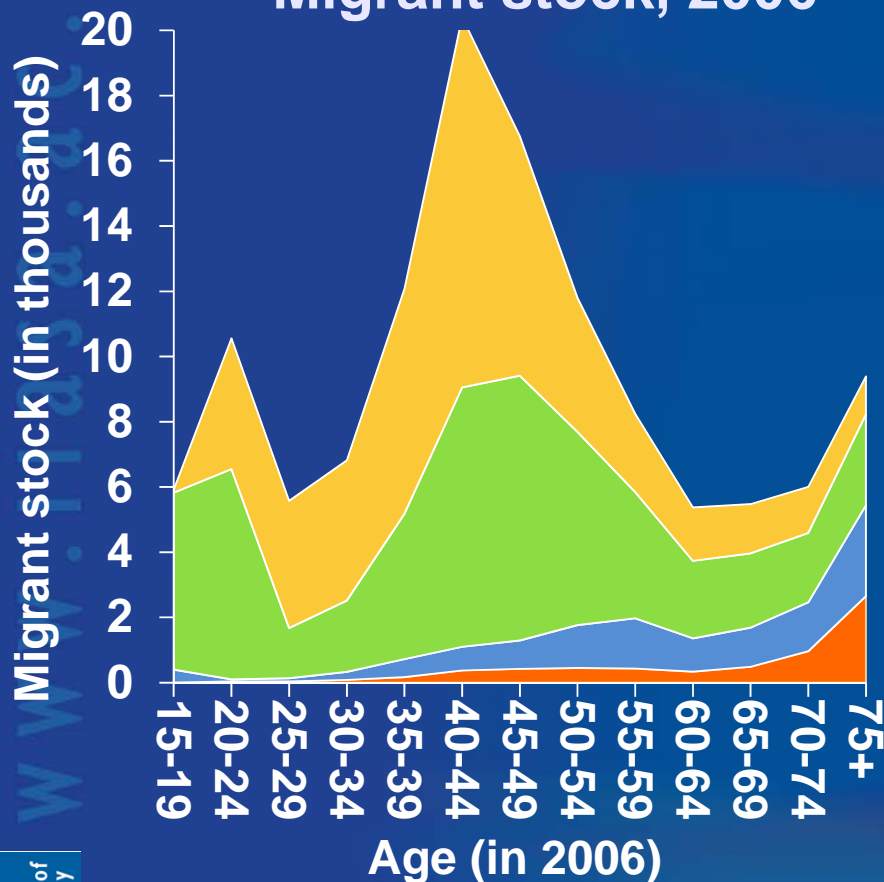




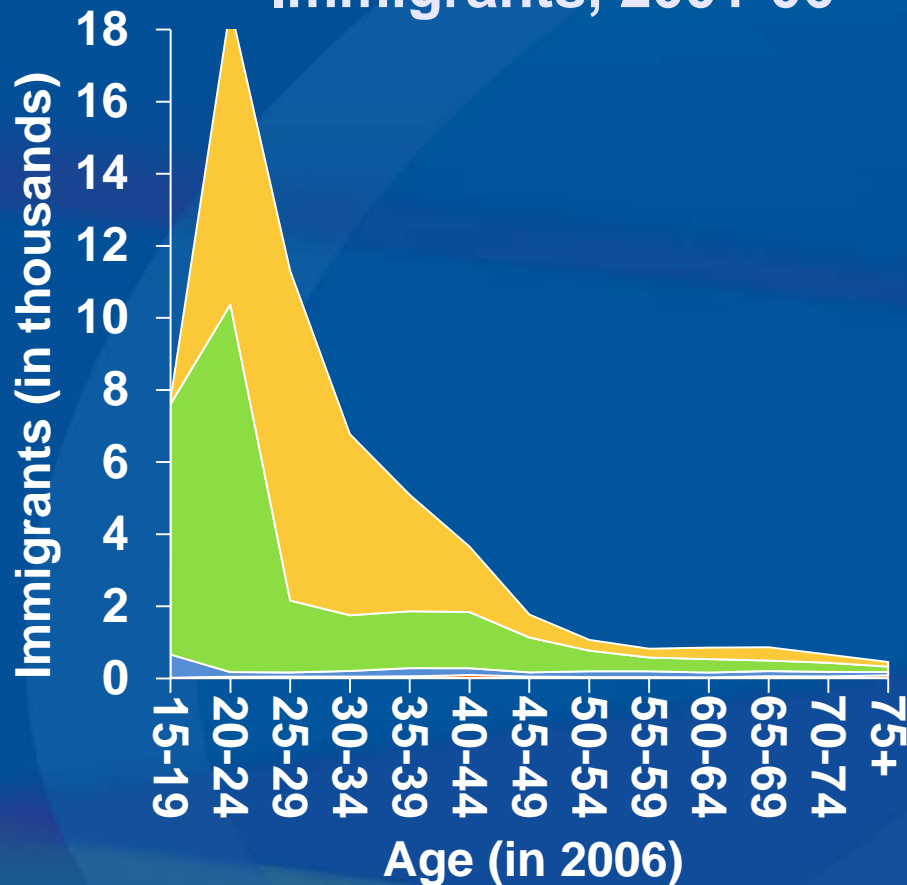
# Australia: Migrant stock and recent immigration of people born in China by education

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### Migrant stock, 2006



### Immigrants, 2001-06



■ tertiary (ISCED 5,6)  
■ primary (ISCED 1,2)

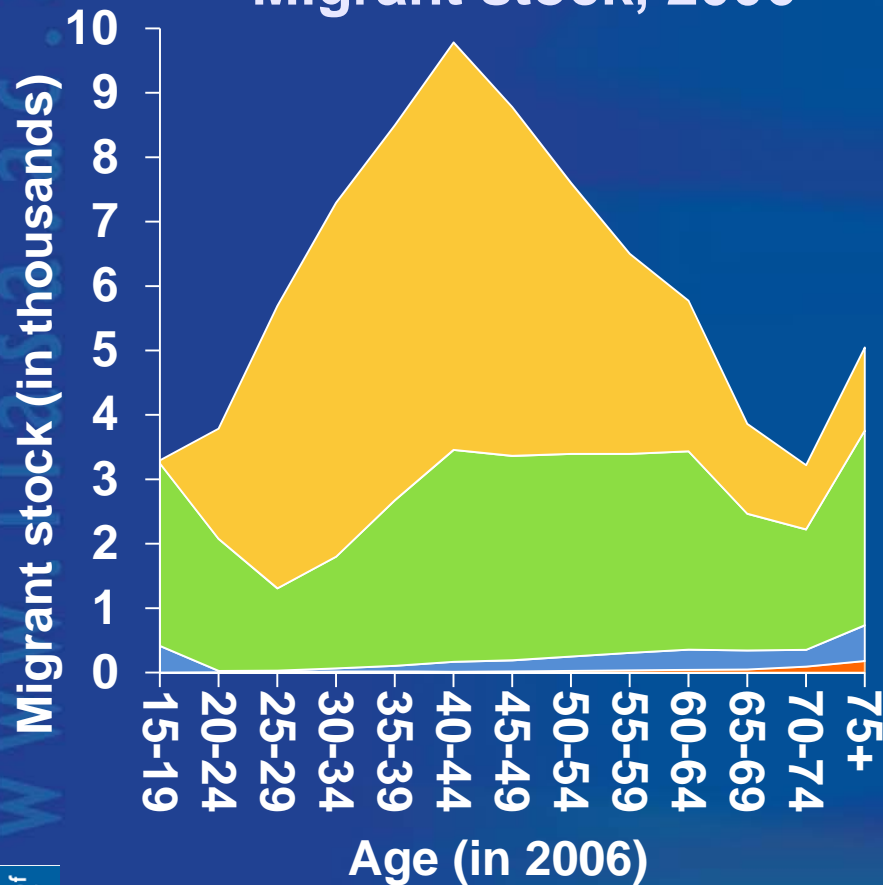
■ secondary (ISCED 2, 4)  
■ no education (ISCED 0)



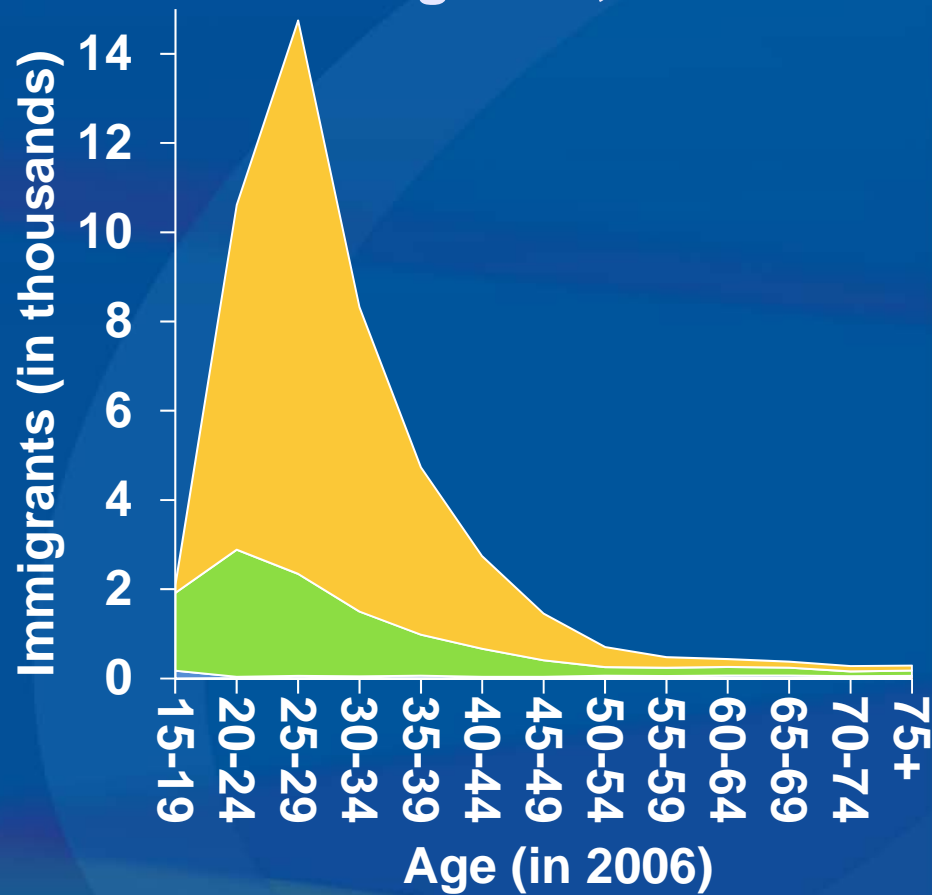


# Australia: Migrant stock and recent immigration of people born in India by education

## Migrant stock, 2006



## Immigrants, 2001-06



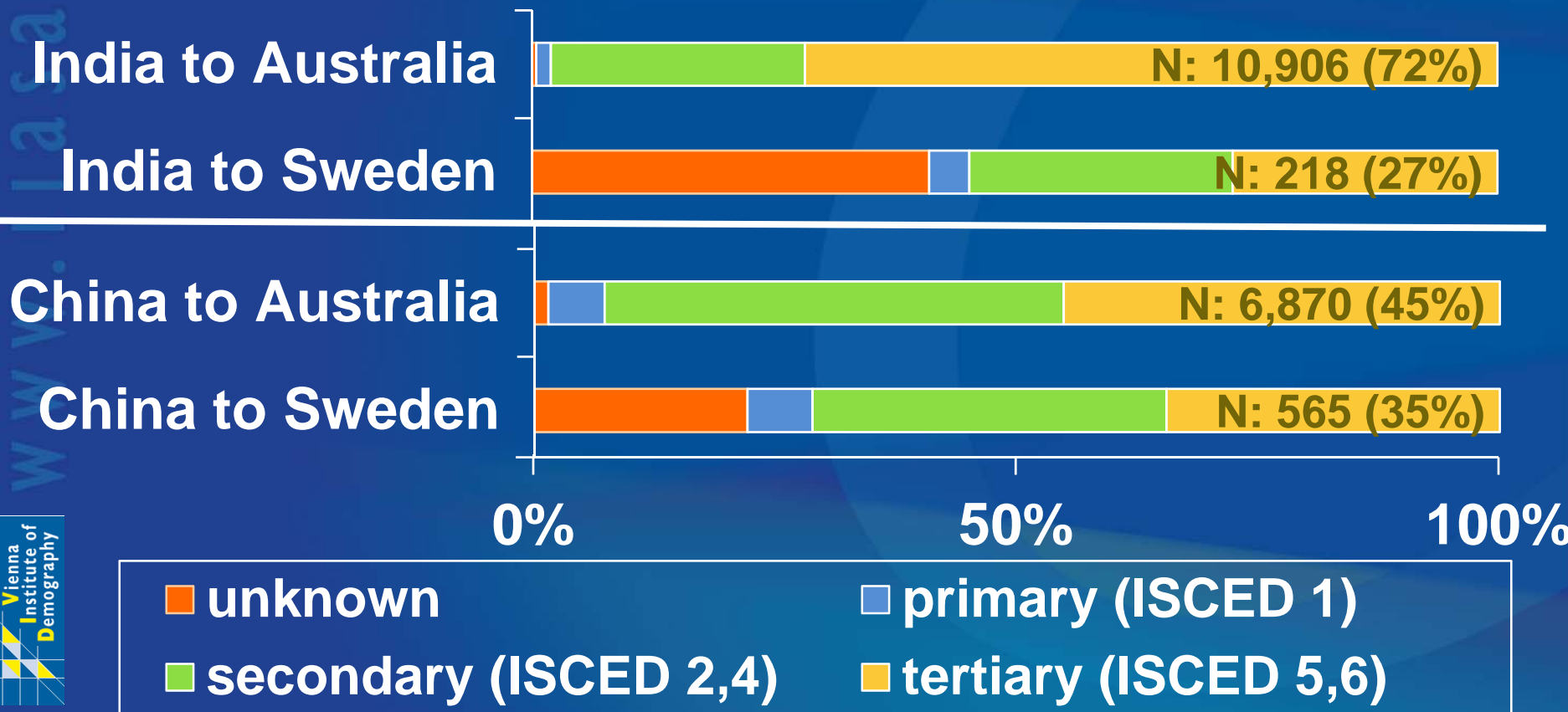
■ tertiary (ISCED 5,6)  
■ primary (ISCED 1,2)

■ secondary (ISCED 2, 4)  
■ no education (ISCED 0)



# Comparing migration from India & China to Australia & Sweden: differences in education structure

- **Australia: Census**
  - transition data, 2005-06, overseas 1 year ago
- **Sweden: Population register**
  - event data, 2005-06

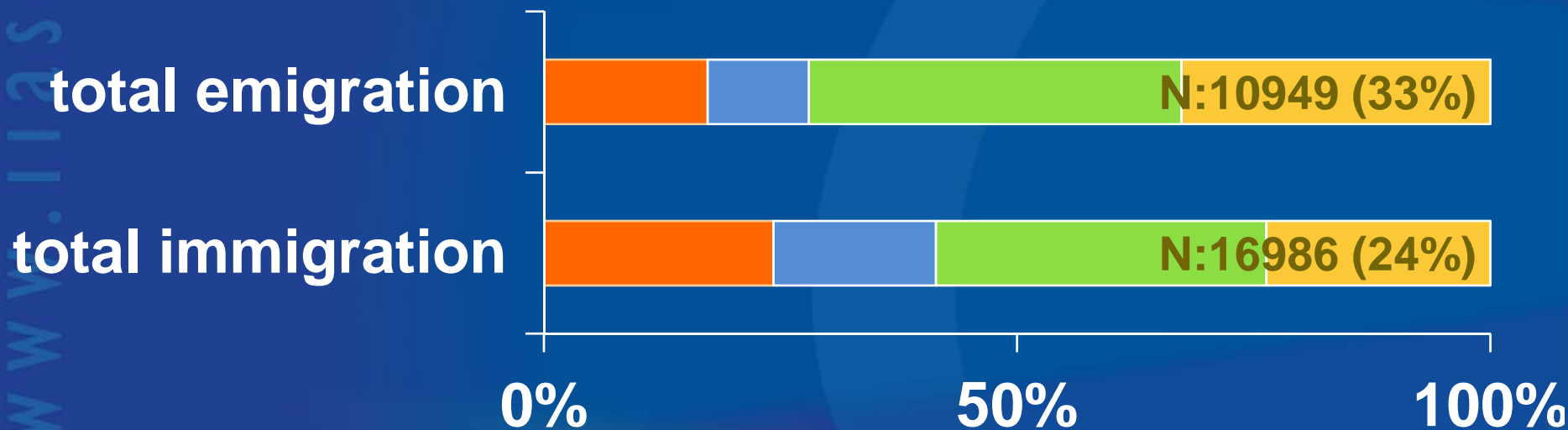






# Emigration and immigration for Sweden: differences in education structure, 2006

No skilled migrant scheme:  
immigrants less educated than emigrants  
→ different structure not captured when using net rates



unknown

secondary (ISCED 2,4)

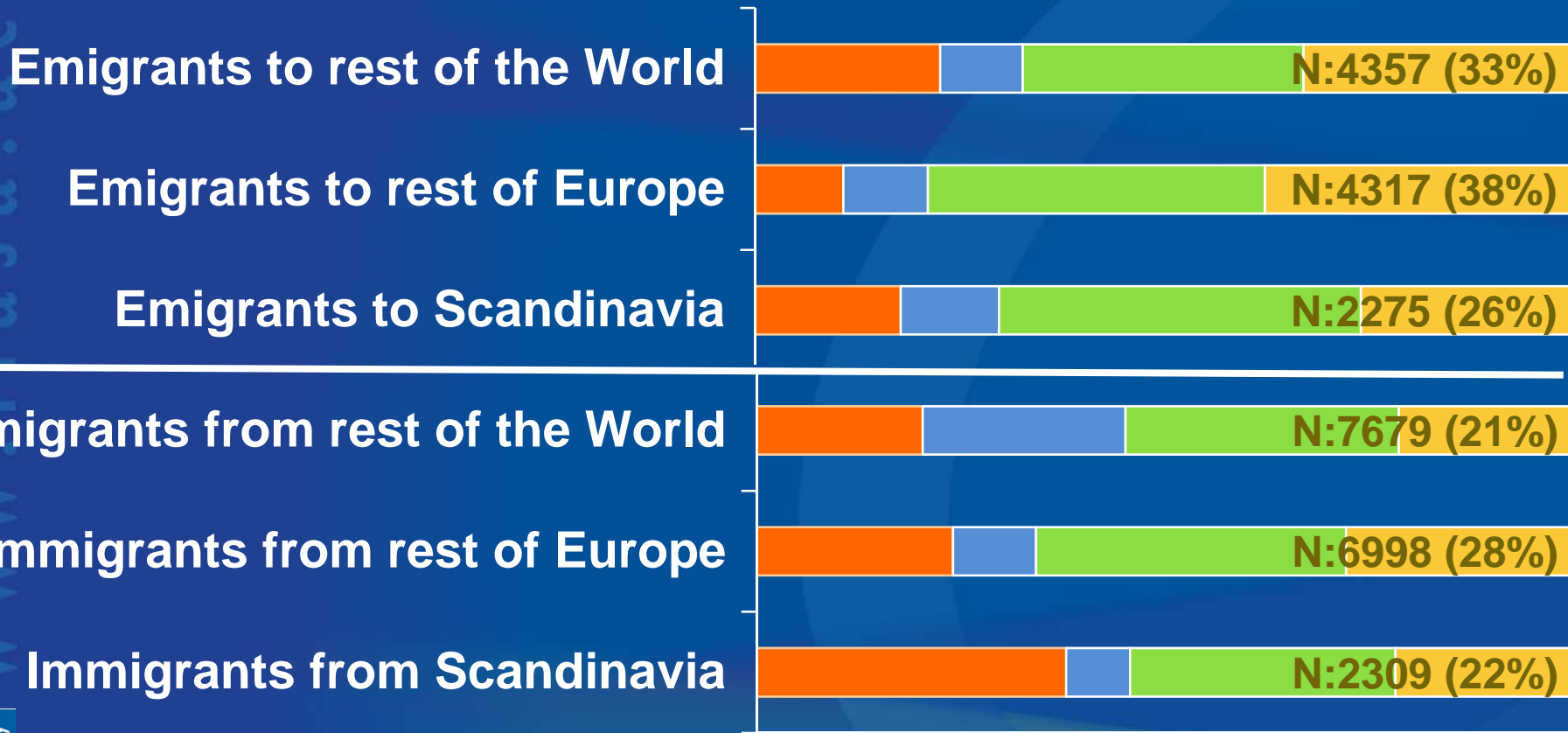
primary (ISCED 1)

tertiary (ISCED 5,6)



# Emigration and immigration for Sweden: differences in education structure by origin / destination, 2006

→ exchange of the highly education with rest of Europe



unknown

secondary (ISCED 2,4)

primary (ISCED 1)

tertiary (ISCED 5,6)



# Multi-state cohort-component projections model by education: the road ahead

- from a pool model to a multi-regional projection model (Rogers 1976, 1995)
- **multi-regional** model requires **origin-destination flows** = a full matrix of flows between 120 countries  
→ a lot of data, small cells!
- a **set of bi-regional** models to approximate the multi-regional model (Wilson & Bell, 2004)





# Imagining the future: scenarios of future migration flows by education

- **current assumption:**  
continuation of trends in 1995-2000
- **future determinants:**  
climate change, labour shortages, population ageing
- **3 dimensions of international migration likely to change**
  - (a) the timing of the move in the life course;
  - (b) the intensity of migration by educational status;
  - (c) their destination choices
- **How much, when, where?**