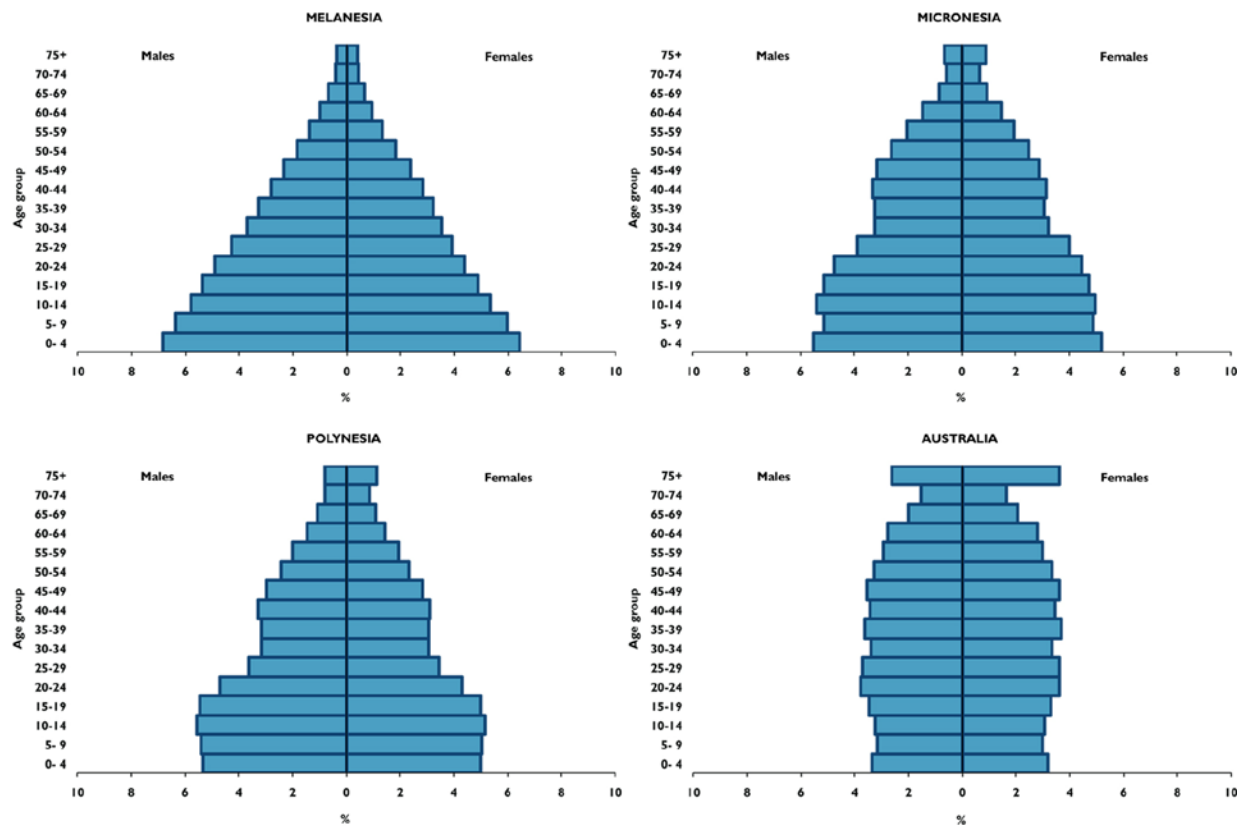# Analyses of census data

Pacific Training Workshop on Use of Population and Housing Census Data for Sub-national Planning

Pyramids

☐ Tools for presenting an age and sex distribution graphically and may be drawn using absolute numbers and percentages.

☐ Pyramid uses:

- Age structure by sex
- School Children 0-15
- Working population 16-64
- Dependency burden
  - Children and old population 65+ typically not work
- Changes over time
- Migration

Fertility, mortality and migration

-These three factors affect the shape of population pyramids.

Fertility

☐ Fertility in the Pacific as a region is high –particularly in the large Melanesian countries.

   ■ High-fertility populations have pyramids are wide at the base and narrow at the top

   ■ Low-fertility populations tend to have a smaller percentage of children and a corresponding higher percentage of old people.

Fertility

☐ Fertility can be calculated from census for any age group.

- The fertility is based on questions related to the recollection of children ever born.

- Fertility cannot be based on a simple tabulation from the census.

	Fertility rate					Adolescent fertility rate		
	Live births per woman					Live births per 1,000 women (aged 15-19)		
	90-95	95-00	00-05	05-10	2011	95-00	00-05	05-10
East and North-East Asia	2.0	1.8	1.7	1.6	1.6	6.5	7.8	8.0
South-East Asia	3.1	2.7	2.5	2.3	2.2	41.2	41.3	39.3
South and South-West Asia	3.9	3.5	3.0	2.8	2.6	106.3	88.0	75.4
North and Central Asia	2.1	1.7	1.7	1.8	1.8	37.4	26.9	27.6
Pacific islands	4.4	4.3	4.1	3.8	3.6	68.2	63.9	61.2
Africa	5.6	5.2	4.9	4.6	4.4	116.1	110.7	101.3
Europe	1.6	1.5	1.4	1.5	1.6	20.7	17.0	16.2
Latin America and Carib.	3.0	2.7	2.5	2.3	2.2	85.6	81.2	73.4
North America	2.0	1.9	2.0	2.0	2.0	47.6	40.5	38.6
Other countries/areas	5.5	4.8	4.2	3.8	3.5	58.0	52.2	53.0
World	3.0	2.8	2.6	2.5	2.5	66.8	60.4	55.7

Fertility, mortality and migration

-These three factors affect the shape of population pyramids.
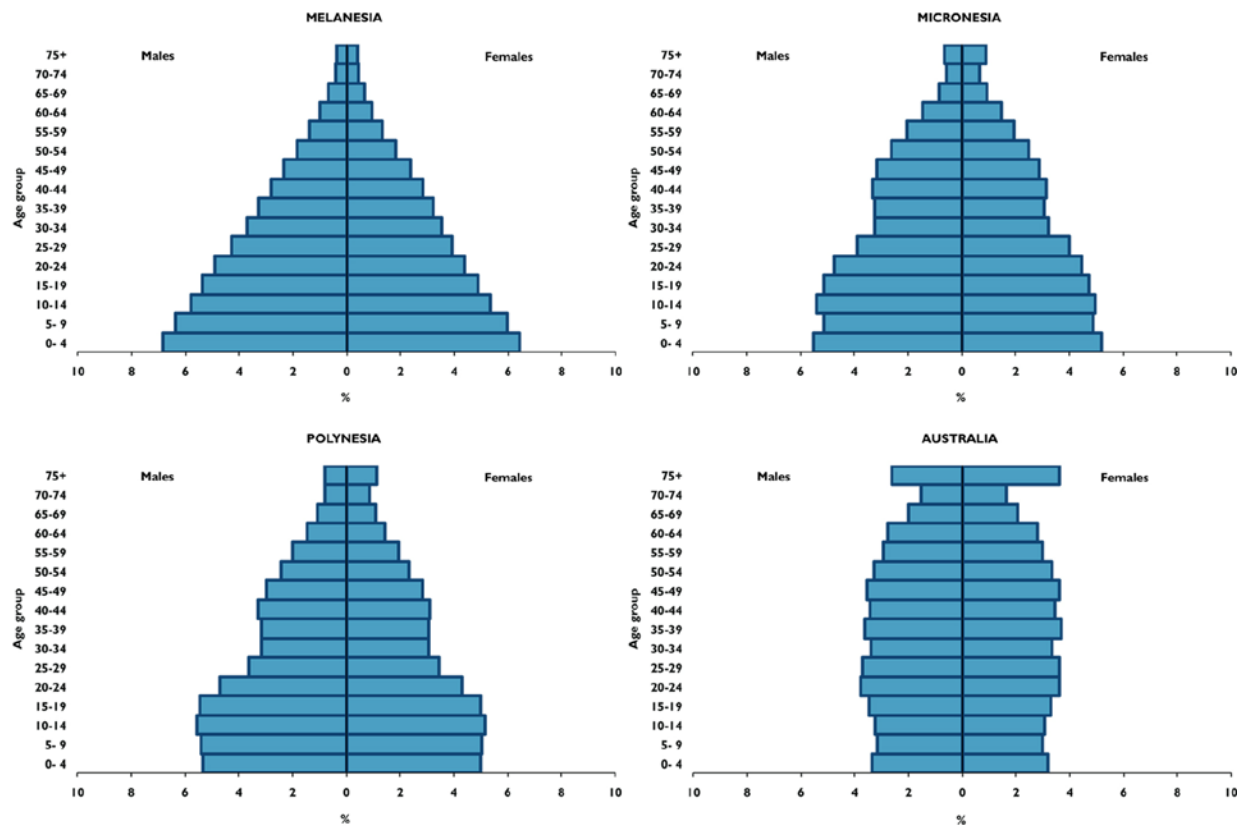
Mortality

☐ The effect of mortality on the shape of pyramids:

  ◼ If childhood mortality is high relative to adult mortality, the population pyramid will slope more at young ages, but less rapidly at adult ages – but this is usually not as evident as the effect of fertility on the population pyramid.

☐ Longer lives means that there will be more people in the very top of the population pyramid (top age ranges).

Life expectancy

☐ Life expectancy is the average number of additional years a person can expect to live if current mortality trends were to continue (from a life table or census – example of life table shown below)

☐ Life expectancy at birth is the average number of year a newborn infant can expect to live current mortality trends were to continue.

Exact age (years)	Out of 100,000 males born			Probability that a male who reaches this age		Expected number of years of life remaining at age x
	Number alive at exact age	Average number alive in the age interval	Number dying in the age interval	Lives another year	Dies within a year	
x	l_x	L_x	d_x	p_x	q_x	e_x

Life expectancy

☐ Warning: the calculation of survival rates from the census depends on using the last two census and the figure is sensitive to migration.

■ For this method, a table is created that uses the number of people in each age category from the prior census as compared with the number that "progressed" to correct age in the current census. (For example the 0-4 in 2000 would be compared with the 10-14 in 2010.)

Pacific Online Regional Mapping

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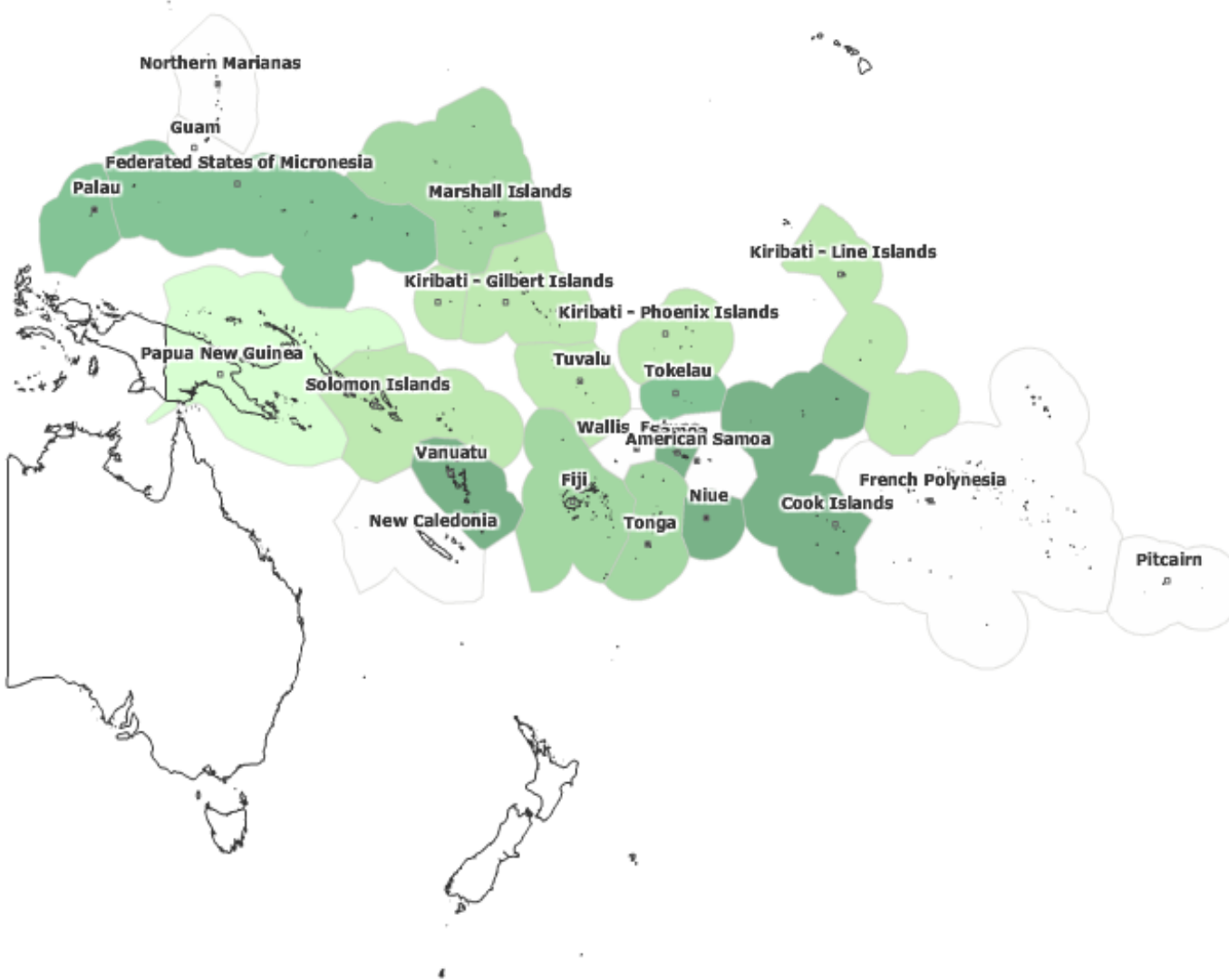
Polygonal Analysis

NMDI - Public Health ▾

PH-VS-1.4 | Life expectancy at birth ▾

PH-VS-1.4
Life expectancy at birth (-)

- 69.1 to 74.2 (4)
- 67.6 to 69.1 (3)
- 64.5 to 67.6 (3)
- 57.3 to 64.5 (4)
- 54.2 to 57.3 (1)
- No Data (7)

Source: http://www.spc.int/nmdi

zone zooms

Navigation   Zoom in: 100 %

Outputs

Fertility, mortality and migration

-These three factors affect the shape of population pyramids.

Migration

☐ Migration could have different effects:

  ■ Migration of the working age population could result in an dip in the middle of the pyramid.

☐ Migration of people of all ages would not be as evident in the pyramid.

Fertility, mortality and migration

-These three factors affect the shape of population pyramids.
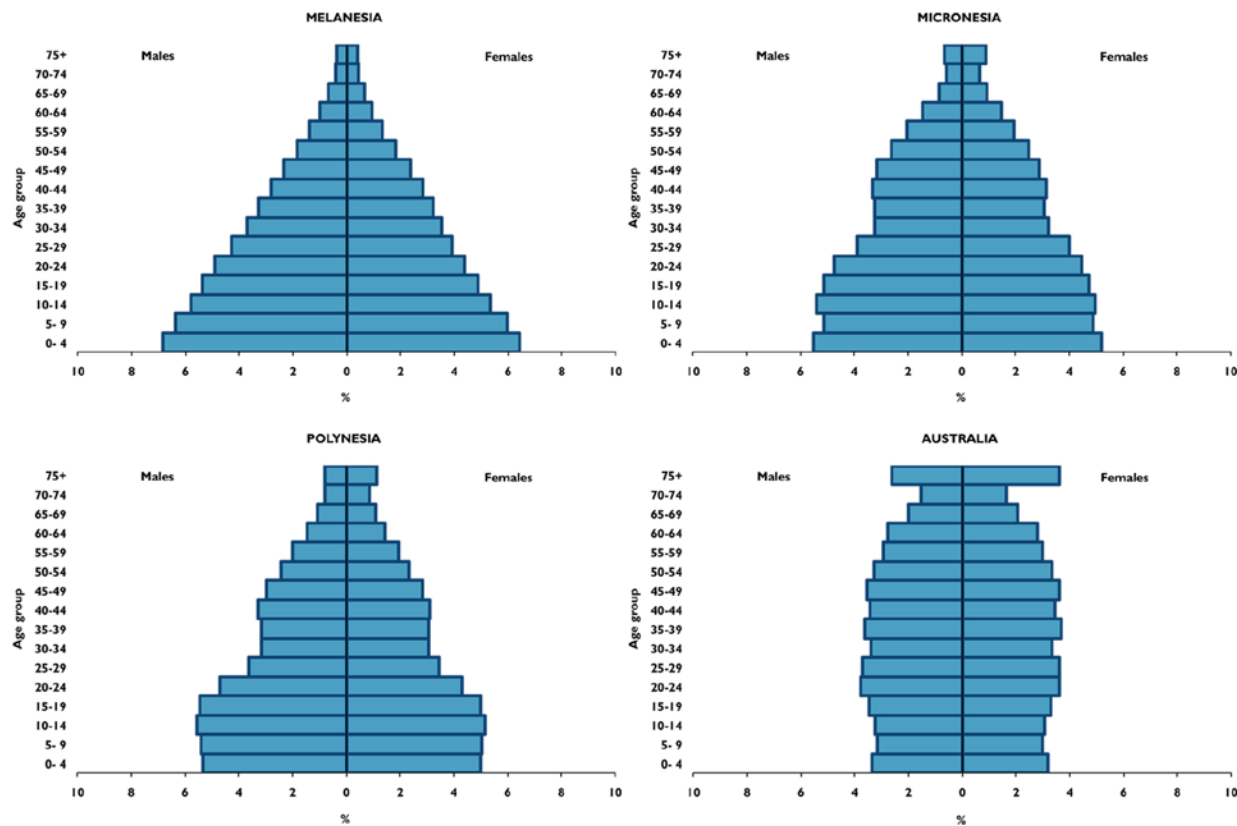
Age dependency ratio

☐ The ratio of the economically dependent part of the population to the productive part – defined as the ratio of "dependant" persons (under 15 and over 64 years of age) to those in the "economically productive ages" (15-59 or 15-64 years of age).

- ■ Total dependency ratio = (Population <15 + Population >65) / Population 15-64

- ■ Child dependency = Population <15 / Population 15-64

- ■ Old (aged) dependency = Population >64 / Population 15 -64

Demographic transition

☐ The transition from high birth and death rates to low birth and death rates as a country develops from a pre-industrial to an industrialized economic system.
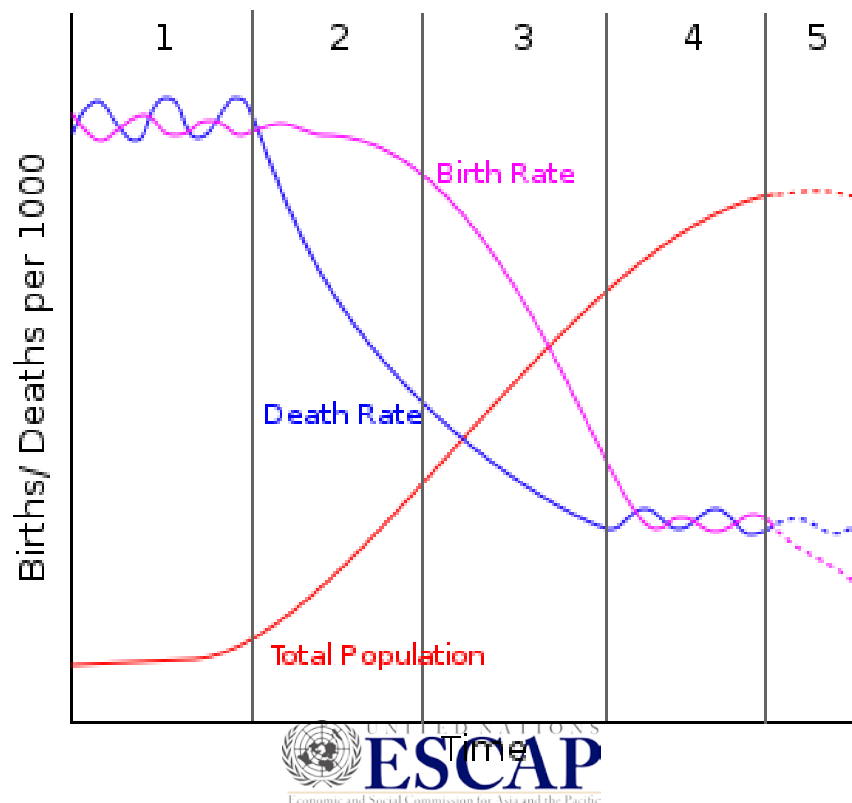
# Link between age dependency ratio and demographic transition

☐ As the population structure becomes less triangular, there is a period where there is a decline in youth dependency but not yet a tremendous increase in old age dependency.

■ This is a **demographic window of opportunity** that can potentially produce economic growth through an increase in the ratio of working age to dependent population; the **demographic dividend.**
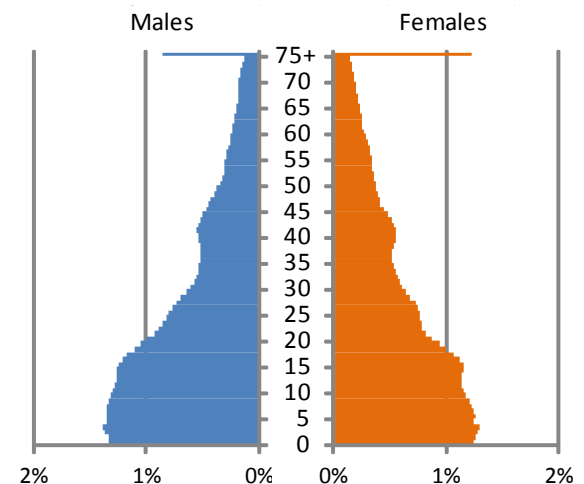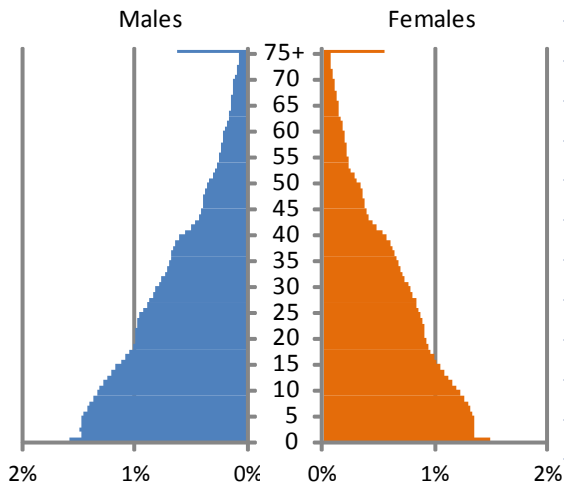
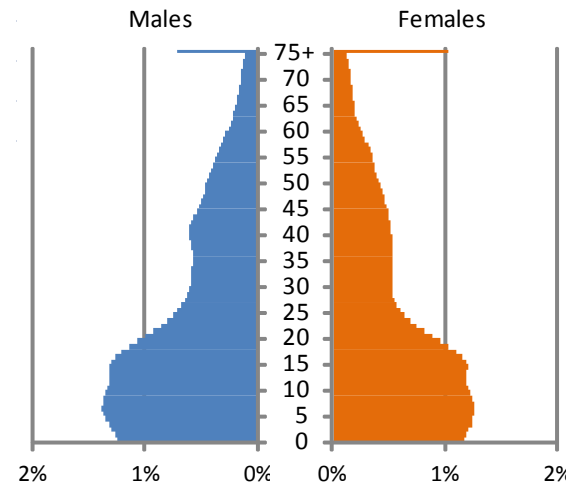# Demographic window?
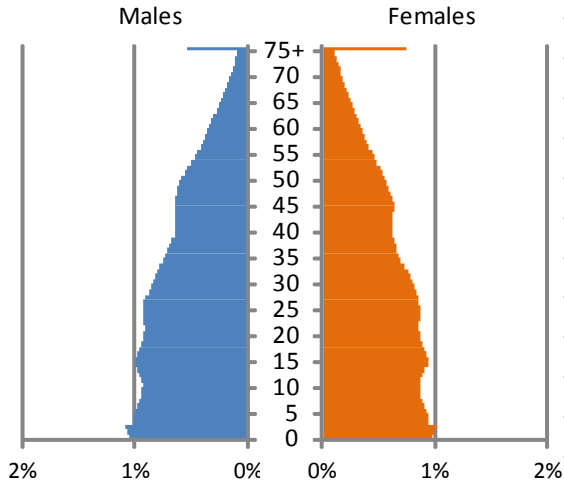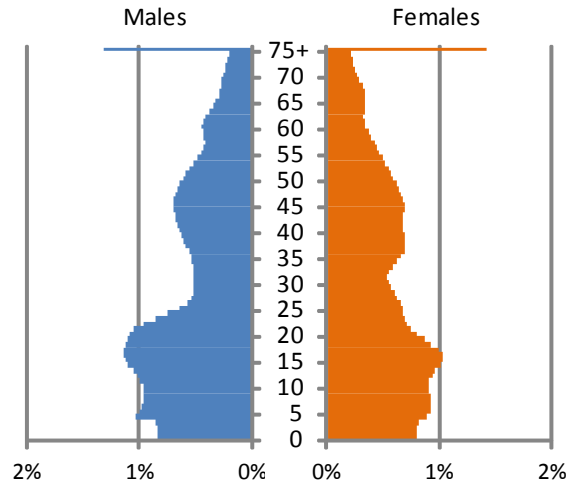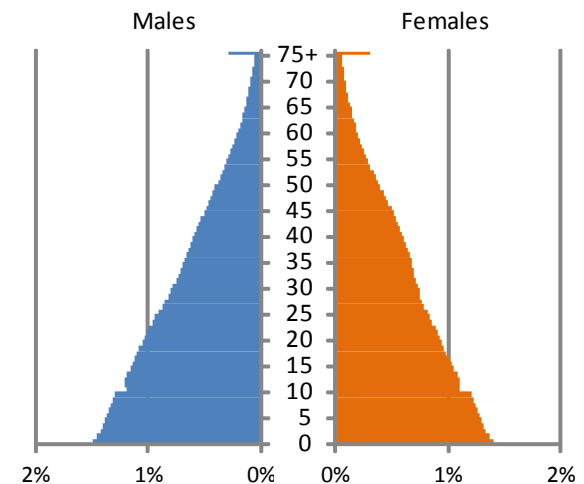
Solomon Islands still has a very high child dependency rate – not yet in the demographic window.

Solomon Islands:
Total Population (shaded) & Labour Force (bars)
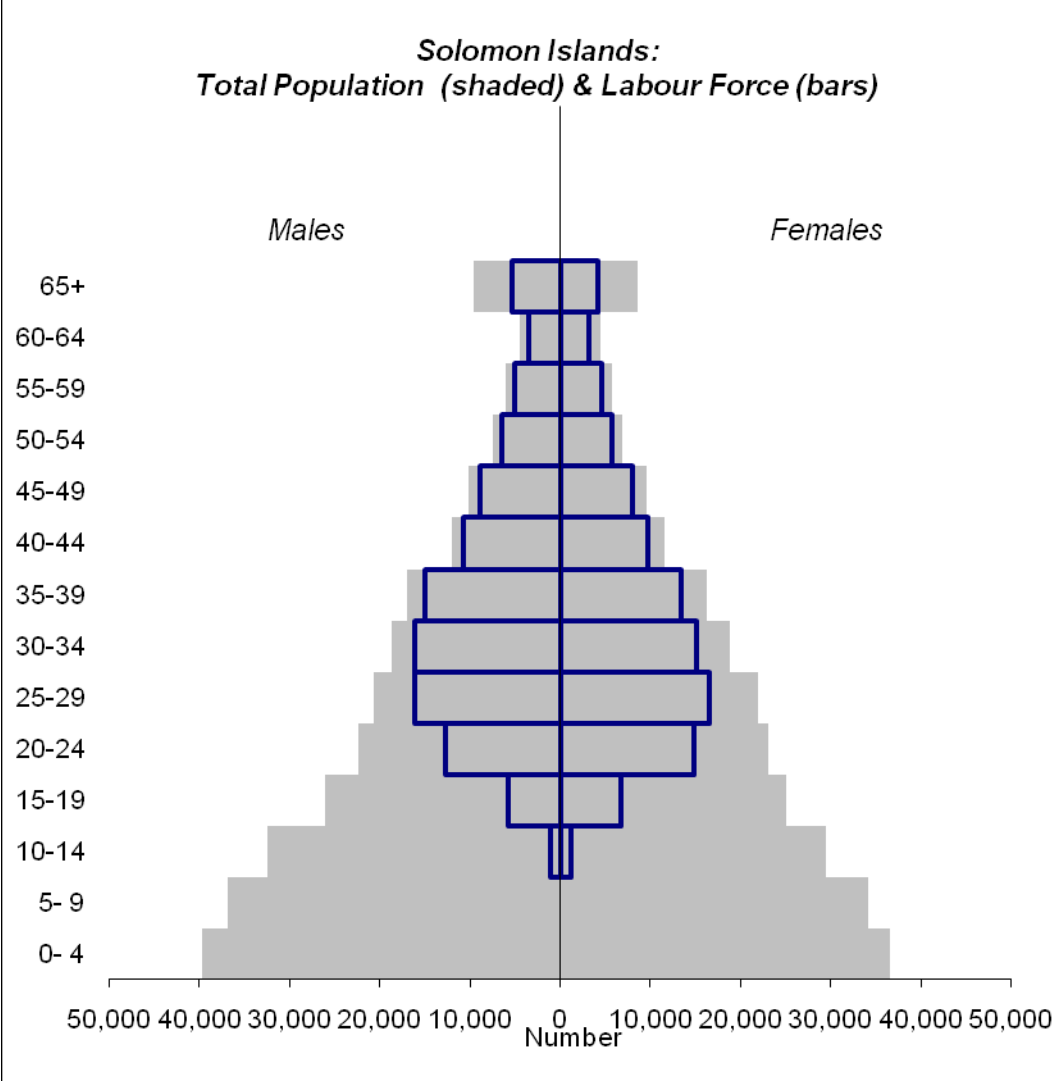
Administrative data for demographic analysis

- ☐ A CRVS system can include information on births, deaths and marriages.
  - ■ Marriages are based on national definitions and thus international comparisons are tricky.
- ☐ Similarly other admin data sources (health, education, revenue, etc.) contain a wealth of data.

Comparison

☐ Advantages of admin data:

   ■ Recorded at the time of event.

   ■ Inexpensive once established.

☐ Disadvantages

   ■ Admin data sources are often incomplete and prone to errors (in some cases admin data is linked to the funding of the agency providing data).

   ■ Expensive to establish functional admin information system.