

How Risky Is Life?

A Mathematics Case Study

Pupil Handouts



HOW RISKY IS LIFE – PUPIL HANDOUTS

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* Suggest that O1 is copied onto an overhead transparency, or shown on a data projector.

S1 Some press cuttings

HOW RISKY IS RIDING?
Why pony clubs are under threat

Pupils sent
to school
in body
armour

Want to move your
office chair? You'll
have to give 48 hours'
notice say the health
and safety police

panic over killer tsunami
bird flu

Child kidnap

**TEENAGER
IN KNIFE
KILLING**

DON'T GO OUT ALONE, WOMEN WARNED

**Heart
problems?**

Red meat risk

Armed robbers

► Paddington crash
apology 'is too late'
► Safety failings
were inexcusable

climate change

cancer jabs for girls of 12

Breathing polluted city air may be worse
for you than fallout from an atom bomb

S3 Some possible causes of unexpected death

Assault and Murder	Air travel accidents
Road accidents	Terrorism
Accidental poisoning	Forces of nature (storms etc)
Accidents at school	Accidents at home
Accidents at work	

S4 Deaths from various causes in 2005 (England and Wales)

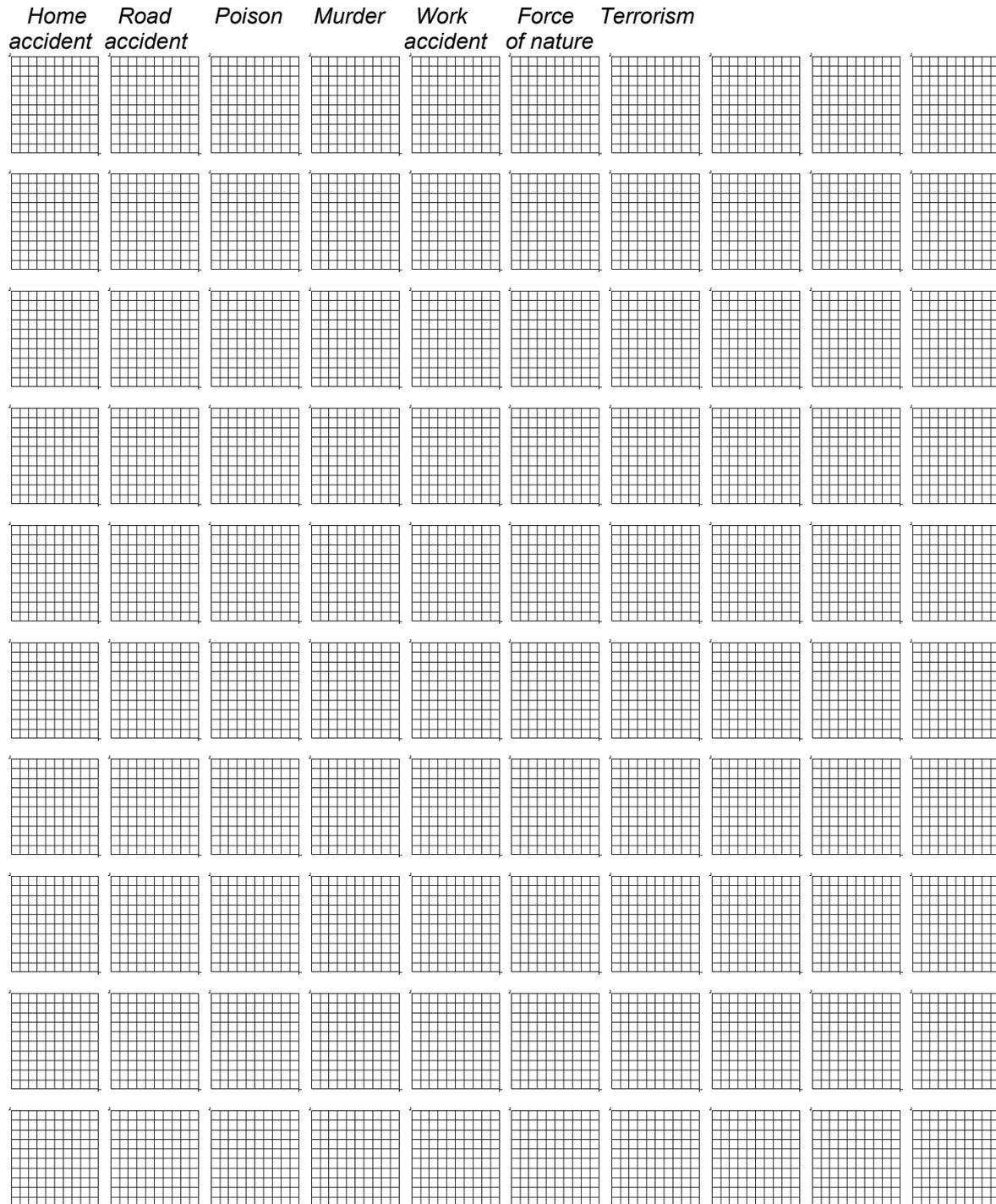
<p>Assault and Murder</p> <p>643</p>	<p>Air travel accidents</p> <p>19</p>
<p>Road accidents</p> <p>2,697</p>	<p>Terrorism</p> <p>52</p>
<p>Accidental poisoning</p> <p>913</p>	<p>Forces of nature (Storms etc)</p> <p>86</p>
<p>Accidents at school</p> <p>4</p>	<p>Accidents at home</p> <p>3,892</p>
<p>Accidents at work</p> <p>350</p>	

S5 Estimated proportion of people that die from each cause.

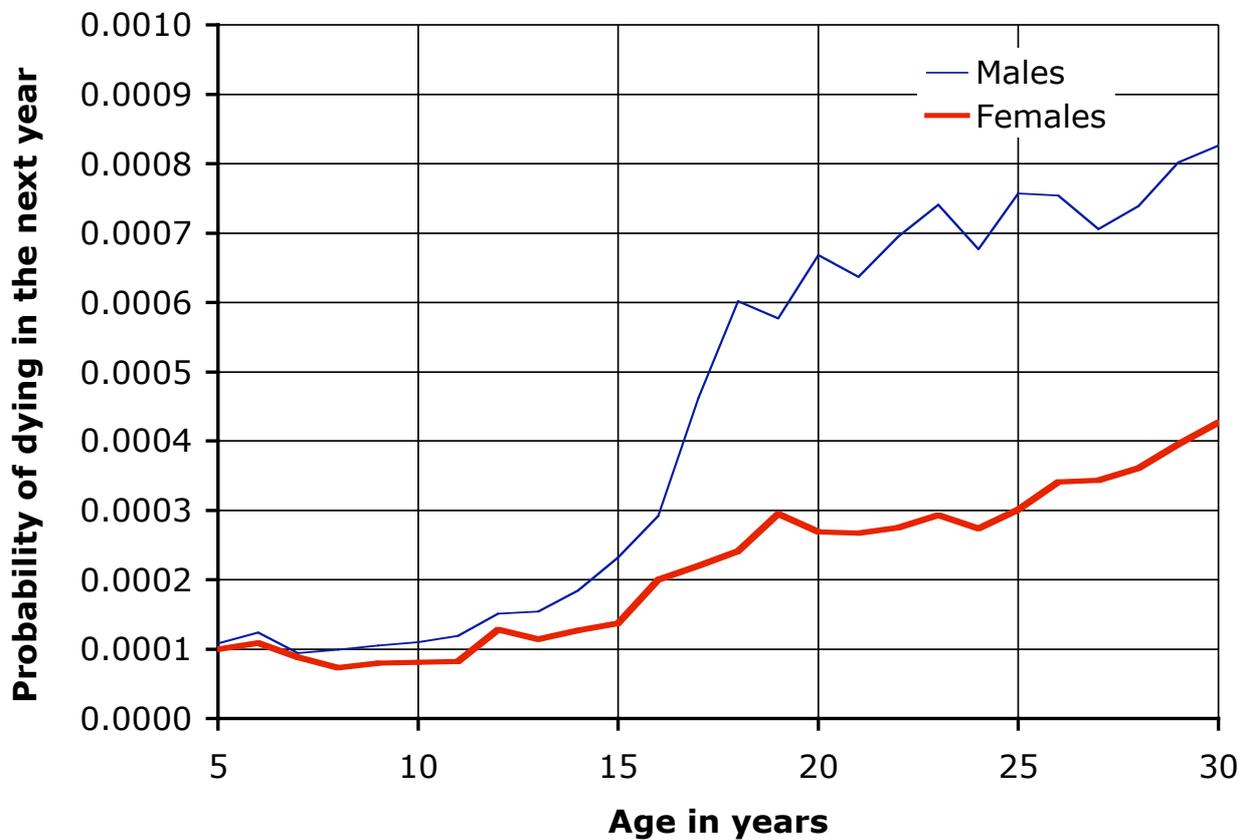
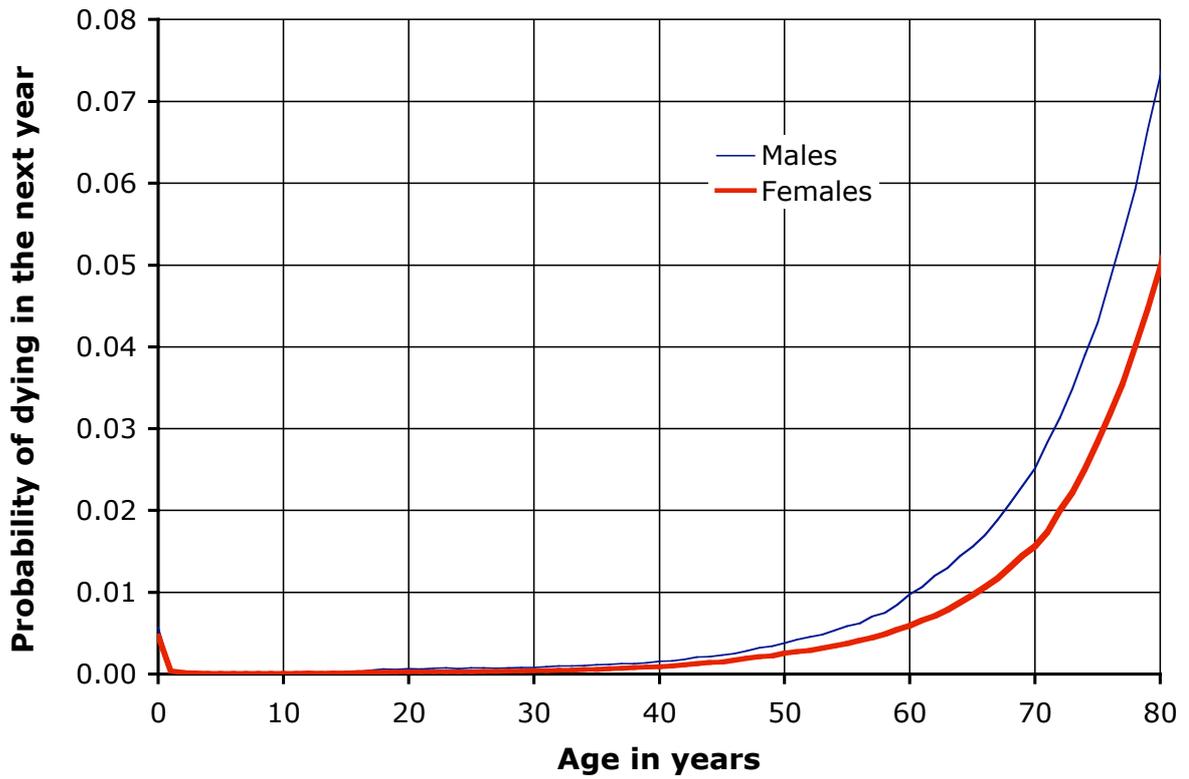
Very high risk	1 in 10 One death in ten people each year	Approx. number out of 50 million people
High risk	1 in 100 One death in a hundred people each year	Approx. number out of 50 million people
Moderate risk	1 in 1,000 One death in a thousand people each year	Approx. number out of 50 million people
Low risk	1 in 10,000 One death in ten thousand people each year	Approx. number out of 50 million people
Very low risk	1 in 100,000 One death in a hundred thousand people each year	Approx. number out of 50 million people
Minimal risk	1 in 1,000,000 1 death in a million people each year	Approx. number out of 50 million people
Almost no risk at all	1 in 10,000,000 1 death in ten million people each year	Approx. number out of 50 million people

S6 Representing the proportions that die in a year

Imagine that this diagram shows the whole population (about 50 million)
Work out how many people are represented by each big square and each tiny square. Shade in, near each cause label, to show how many died from that cause in 2005



O1 Base risk of death by age



S7 How risks vary with age

Causes of death (England and Wales, 2005)

Summary table

		Age group				
		1 to 19	20 to 39	40 to 59	60 to 79	80 +
All illness	Male	837	3,652	24,707	104,120	98,312
	Female	663	2,538	17,342	79,412	161,483
	Total	1,500	6,190	42,049	183,532	259,795
All accidents	Male	459	1480	1227	1235	1523
	Female	167	313	487	876	3165
	Total	626	1,793	1,714	2,111	4,688
All other causes	Male	137	1420	1470	625	251
	Female	64	417	561	309	181
	Total	201	1,837	2,031	934	432
Total deaths	Male	1,433	6,552	27,404	105,980	100,086
	Female	894	3,268	18,390	80,597	164,829
	Total	2,327	9,820	45,794	186,577	264,915
Total population	Male	6,390,600	7,316,600	7,098,000	4,219,300	826,900
	Female	6,064,700	7,301,100	7,243,900	4,732,300	1,557,900
	Total	12,455,300	14,617,700	14,341,900	8,951,600	2,384,800

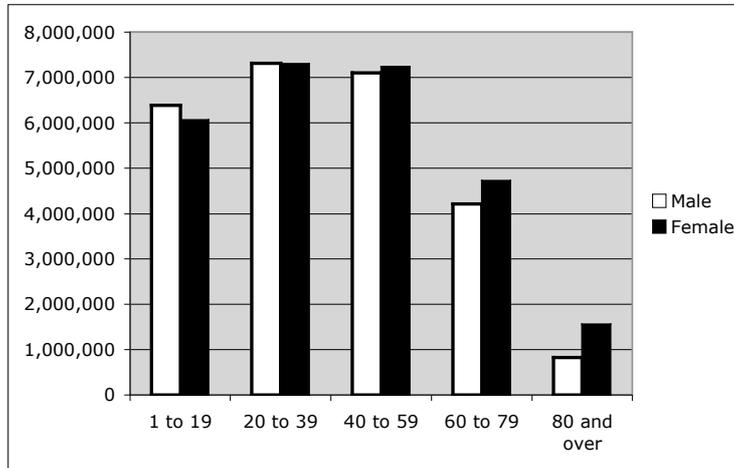
Main causes of unexpected death

		Age group				
		1 to 19	20 to 39	40 to 59	60 to 79	80 +
Road accidents	Male	333	866	449	231	143
	Female	118	161	138	136	119
Accidental falls	Male	16	85	259	505	613
	Female	3	17	114	333	1,058
Drowning accidents	Male	31	29	41	23	3
	Female	8	4	16	14	5
Choking or suffocation accidents	Male	23	49	78	67	47
	Female	11	19	24	44	87
Accidents involving fire or heat	Male	12	26	44	52	29
	Female	5	10	27	34	34
Accidental poisoning	Male	18	348	212	44	6
	Female	19	89	129	37	11
Assault and Murder	Male	49	215	121	40	10
	Female	29	81	53	26	8
Suicide	Male	82	1,184	1,308	487	162
	Female	31	319	469	213	80
Medical complications	Male	5	7	14	82	76
	Female	3	13	25	63	83

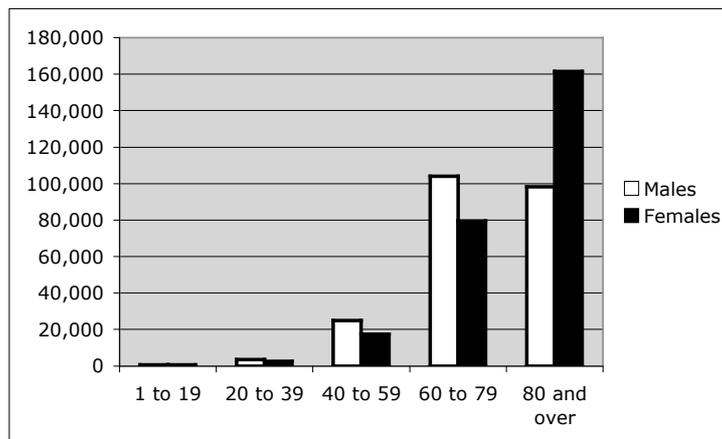
S8 Bar graphs

Decide what each graph shows and give it a title.

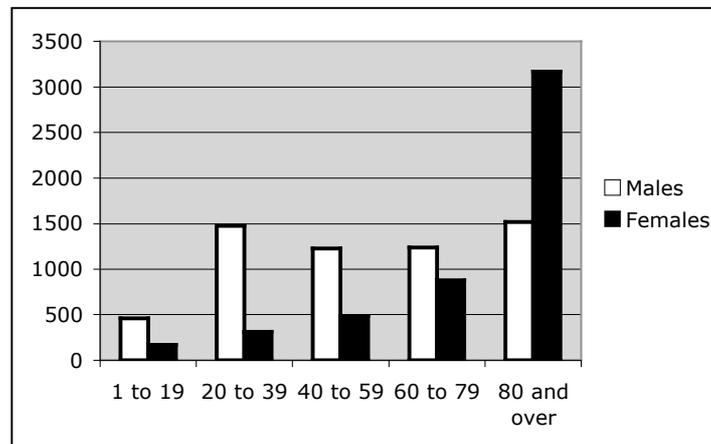
Graph A



Graph B

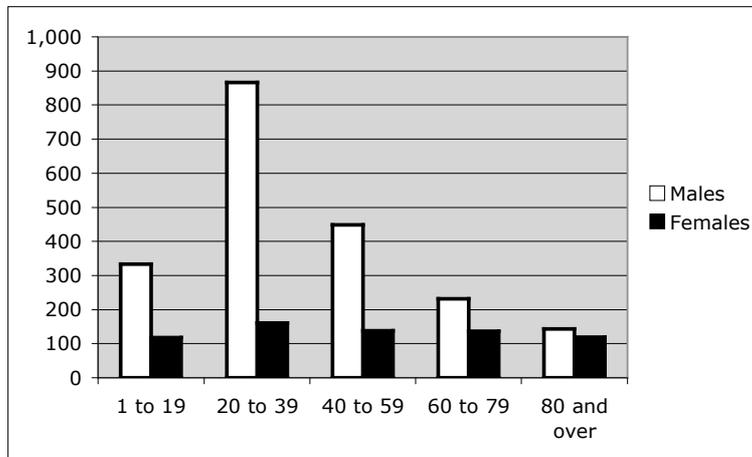


Graph C

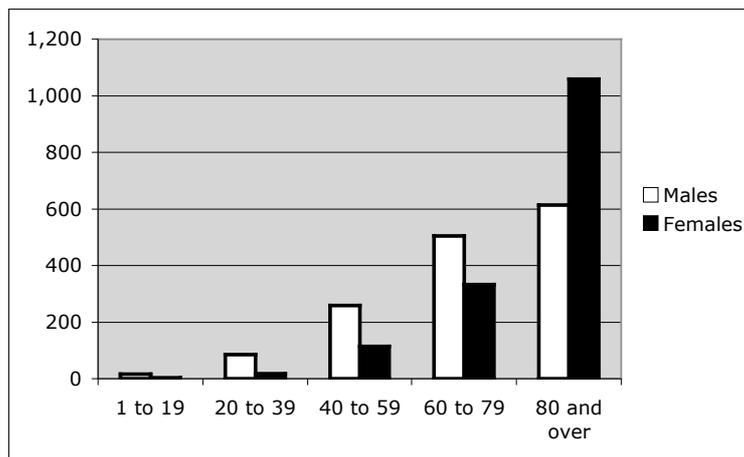


S9 More bar graphs

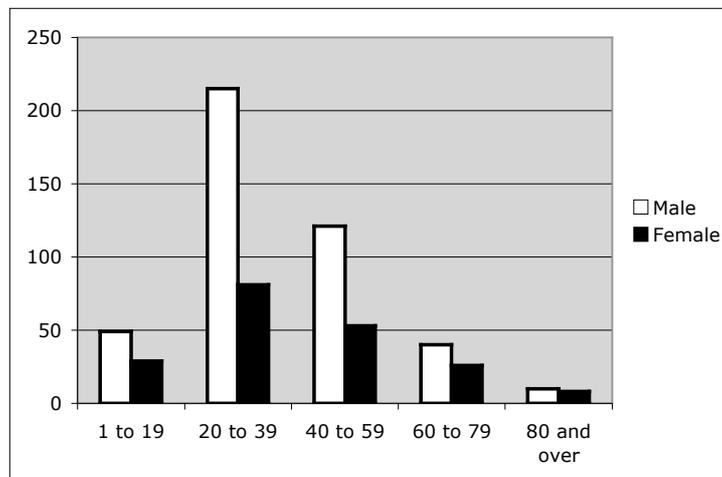
Graph D



Graph E

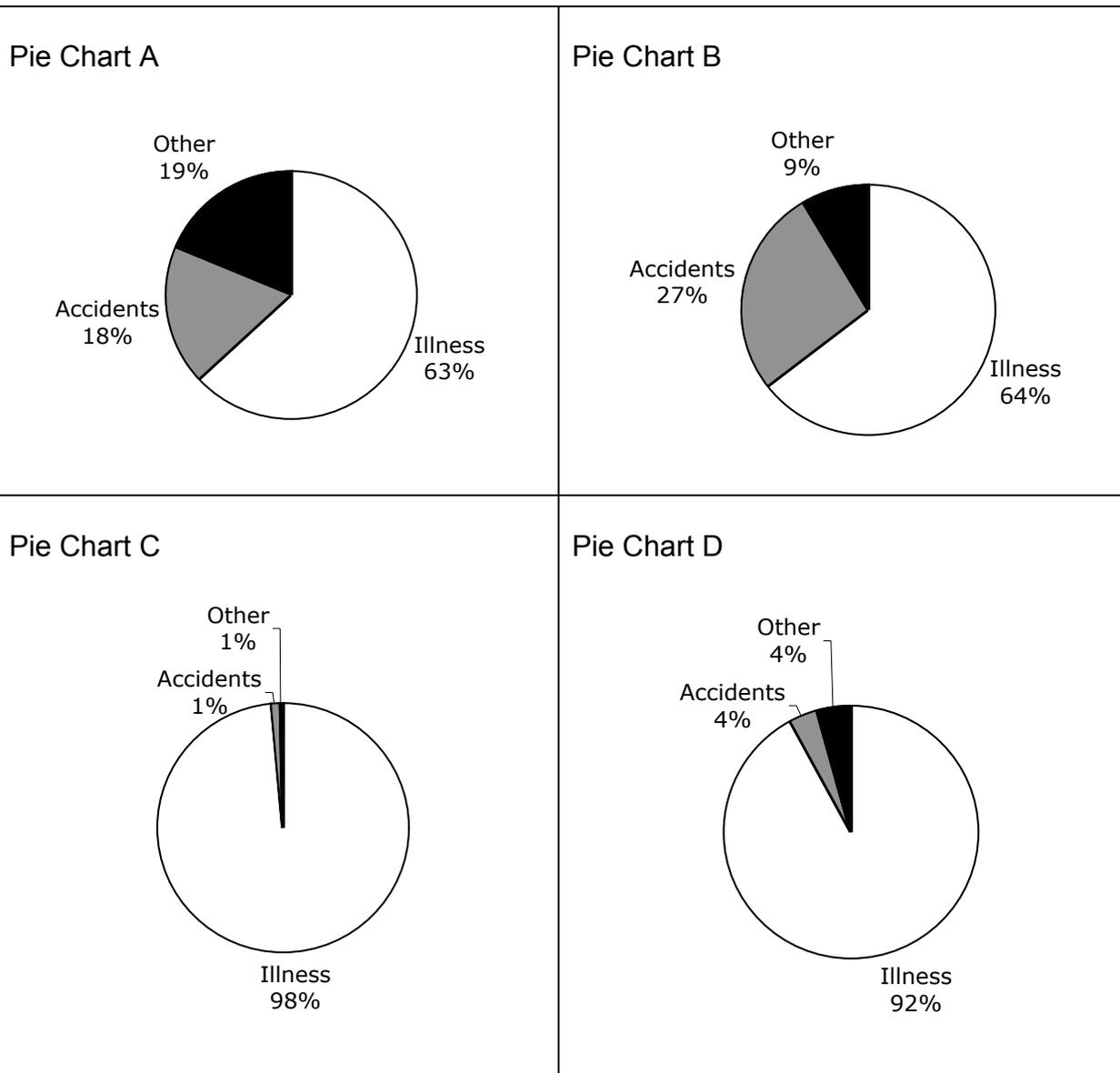


Graph F



S10 Pie Charts

Decide what age group is represented in each pie chart and give it a title.



S11 True, false or impossible to tell?

<p>A</p> <p>Men live longer than women.</p>	<p>B.</p> <p>Nearly all deaths are caused by illness.</p>
<p>C</p> <p>Road accidents are the greatest cause of accidental death for the under 40s.</p>	<p>D</p> <p>Falls are the greatest cause of accidental death among the over 40s.</p>
<p>E</p> <p>Middle-aged men are most at risk of being assaulted or murdered.</p>	<p>F</p> <p>For the "over 80s", women are about twice as likely as men to die in an accident.</p>
<p>G</p> <p>Men are more dangerous drivers than women.</p>	<p>H</p> <p>Old people need not worry about being murdered.</p>
<p>I</p> <p>About 1 in 20,000 Of the "under 20s" dies in an accident each year.</p>	<p>J</p> <p>About 1 in 5,000 of the "over 80s" dies in an accident each year.</p>

S12 Headlines!

Which of these headlines should we be concerned about?
Which might be due to random variation?

<p>WATCH WHAT YOU EAT!</p> <p>The number of deaths from poisoning has risen to 950 - and increase of 50 on the previous year. Doctors are advising us to be more careful when reheating frozen food.</p>	<p>50% MORE SCHOOL DEATHS</p> <p>Over the past year, the number of fatal accidents within schools has risen by 50%. "We must introduce more safety measures" said one spokesman. " Schools are becoming increasingly dangerous places."</p>
<p>MURDERS ON THE INCREASE</p> <p>The number of murders in England and Wales increased by 3% last year. "This is just one more depressing statistic on the state of our society said the opposition spokesman."</p>	<p>FEWER PEOPLE KILLED ON OUR ROADS</p> <p>Road deaths dropped by 10% in the past year. "This proves that the introduction of speed cameras has been effective." claims a department of transport spokesman.</p>
<p>HOMES BECOMING SAFER</p> <p>The number of fatal accidents in the home fell by about 5% last year claimed the centre for research into household accidents. This shows the effectiveness of our recent campaigns.</p>	<p>FEWER AIR DEATHS</p> <p>The number of deaths in air accidents decreased by 20% last year. "This is proof that the safety measures we put into place last year are now working", claimed a spokesman.</p>