

Nursing students' readiness for the numeracy needs of their program: Students' perspective

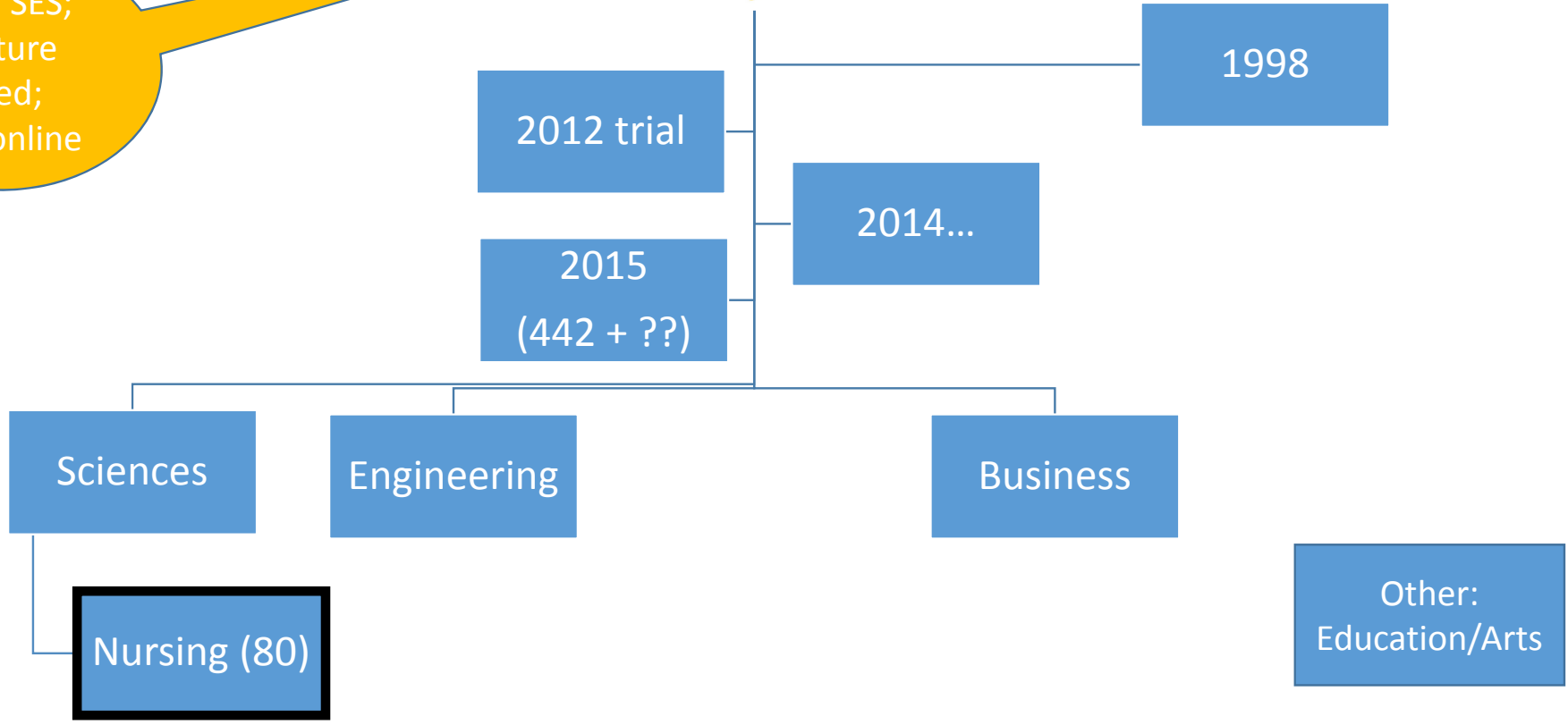
Linda Galligan, Anita Frederiks, Andrew Wandel, Clare Robinson, Shahab
Abdulla, Zanubia Hussain



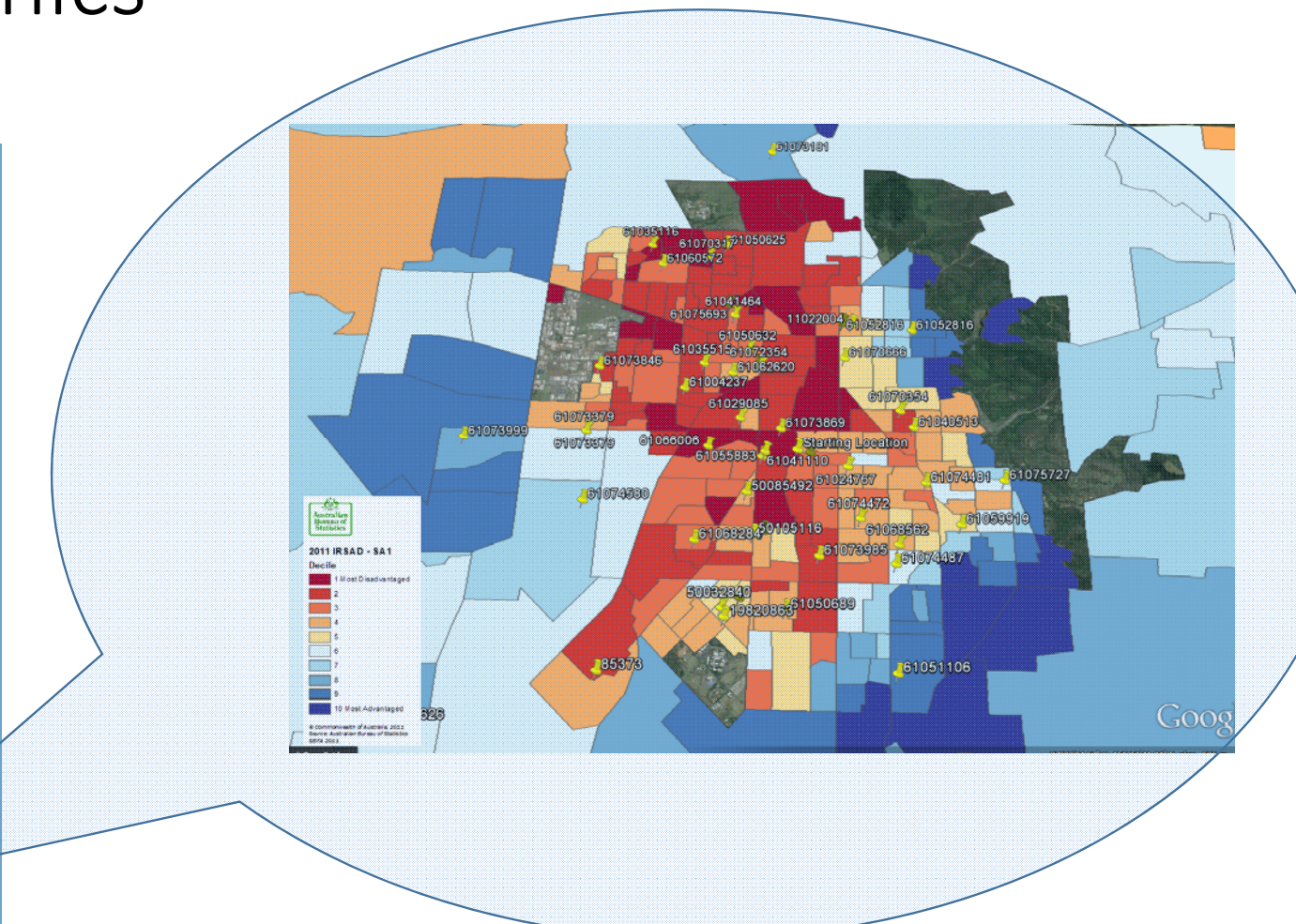
The Big picture



LOW SES;
Mature
aged;
EXT/online



Some demographics



The question

Overall my maths preparation was adequate for the courses that I studied.

Method

- Survey at the end of semester AFTER they have their results
- Selected interviews
- Link survey to overall results and specific concepts
- Lecturers' perceptions (another paper)

Nursing

- Since 1980's at USQ
- Increasing in popularity (+ more health science)
- Large online component (since 2010); multicampus
- Acknowledgement Numeracy is an issue (1st year subject)
- New developments.....

Questions

- Calculator use
- Decimals
- Percentages
- Ratio
- Algebra
- Statistics
- Problem solving
- Demographics
- Overall perception
- Open-ended questions

Results of responses to survey

year	course	No. students (total cohort)	dropped
2012 (s1) TRIAL	MAT1008**	20 (262)	30
2014 (s1)	NUR1140**	23 (330)	69
2015 (s1)	NSC1500; MAT1008	74 (703); 56 (647)	143, 154
2015 (s2)	NUR2000; MAT1008	79 (702), 29 (386)	104, 87

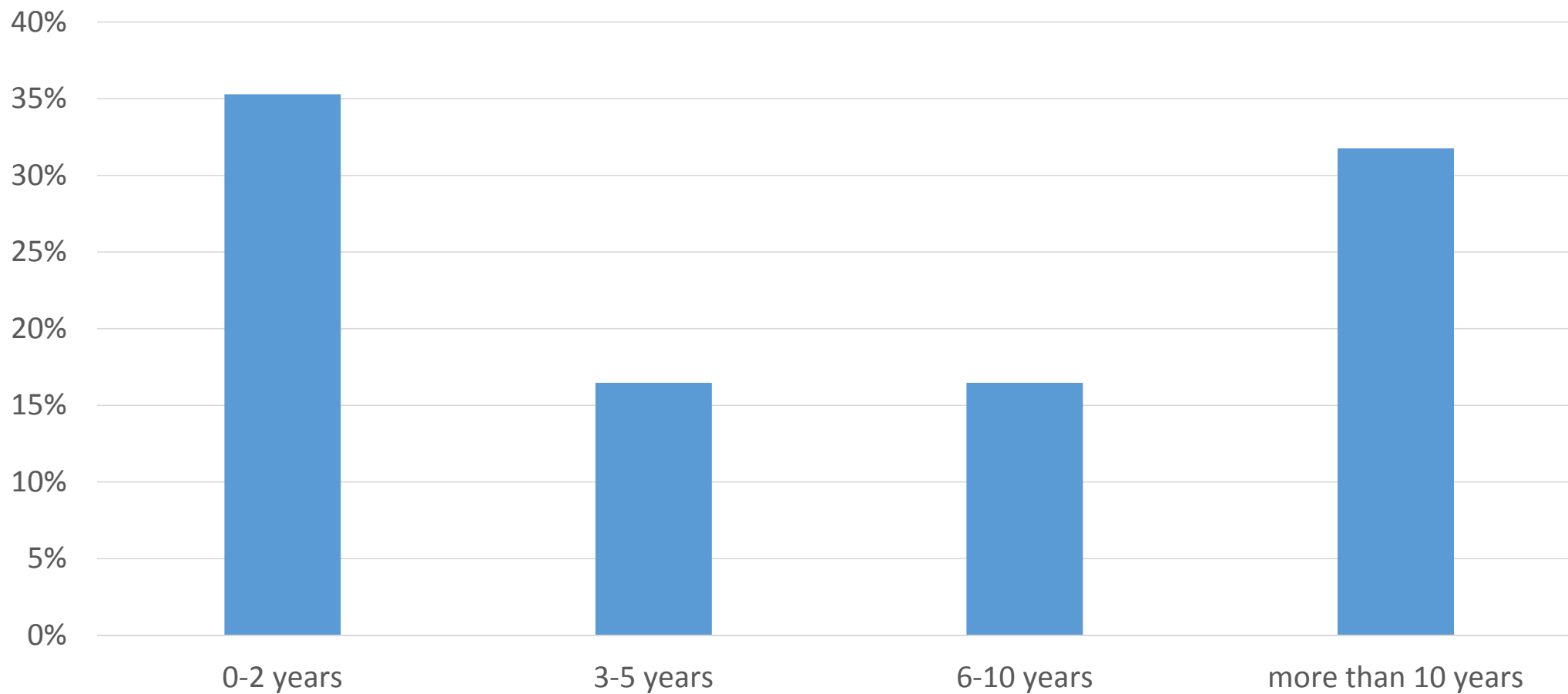
Slide 8

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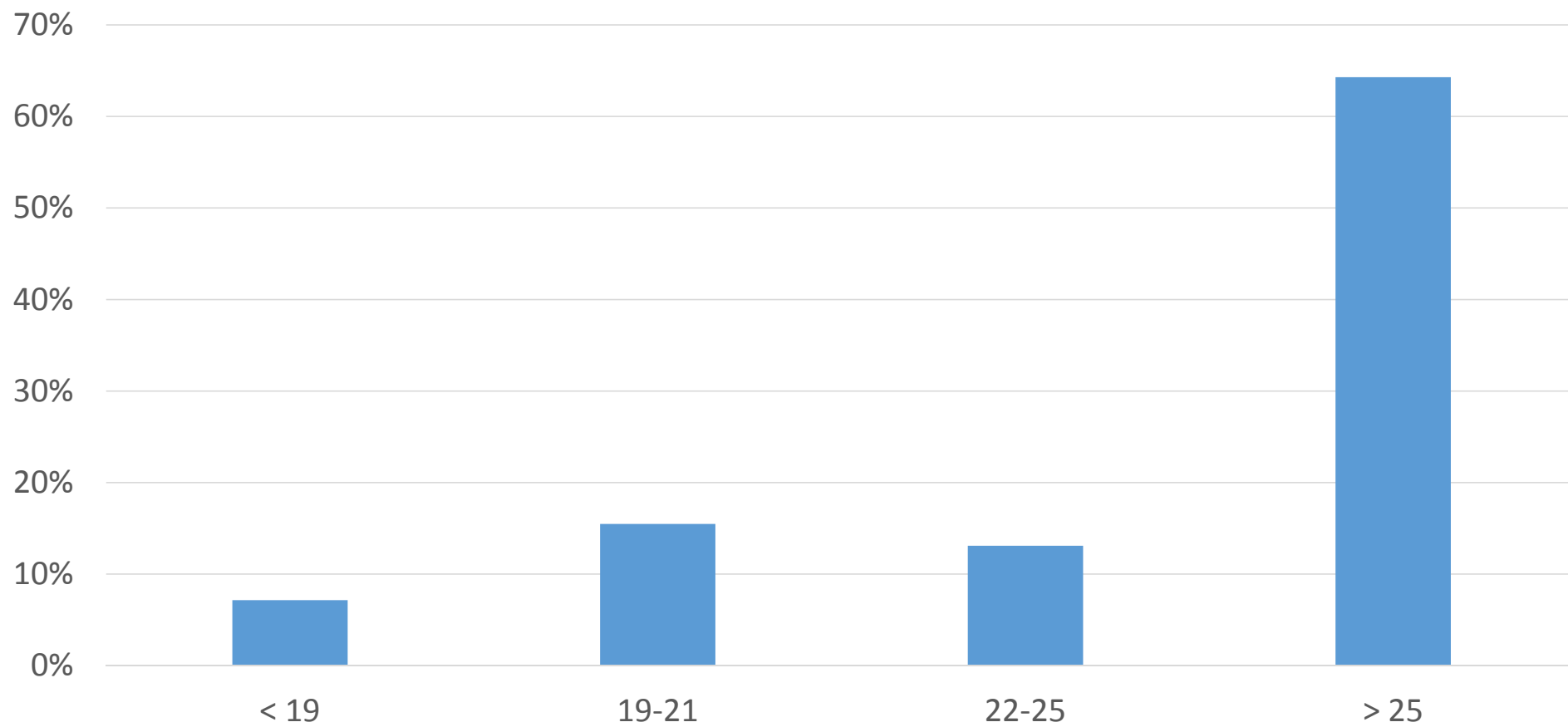
51 - 50 plus one I cannot find

Anita Frederiks, 1/06/2016

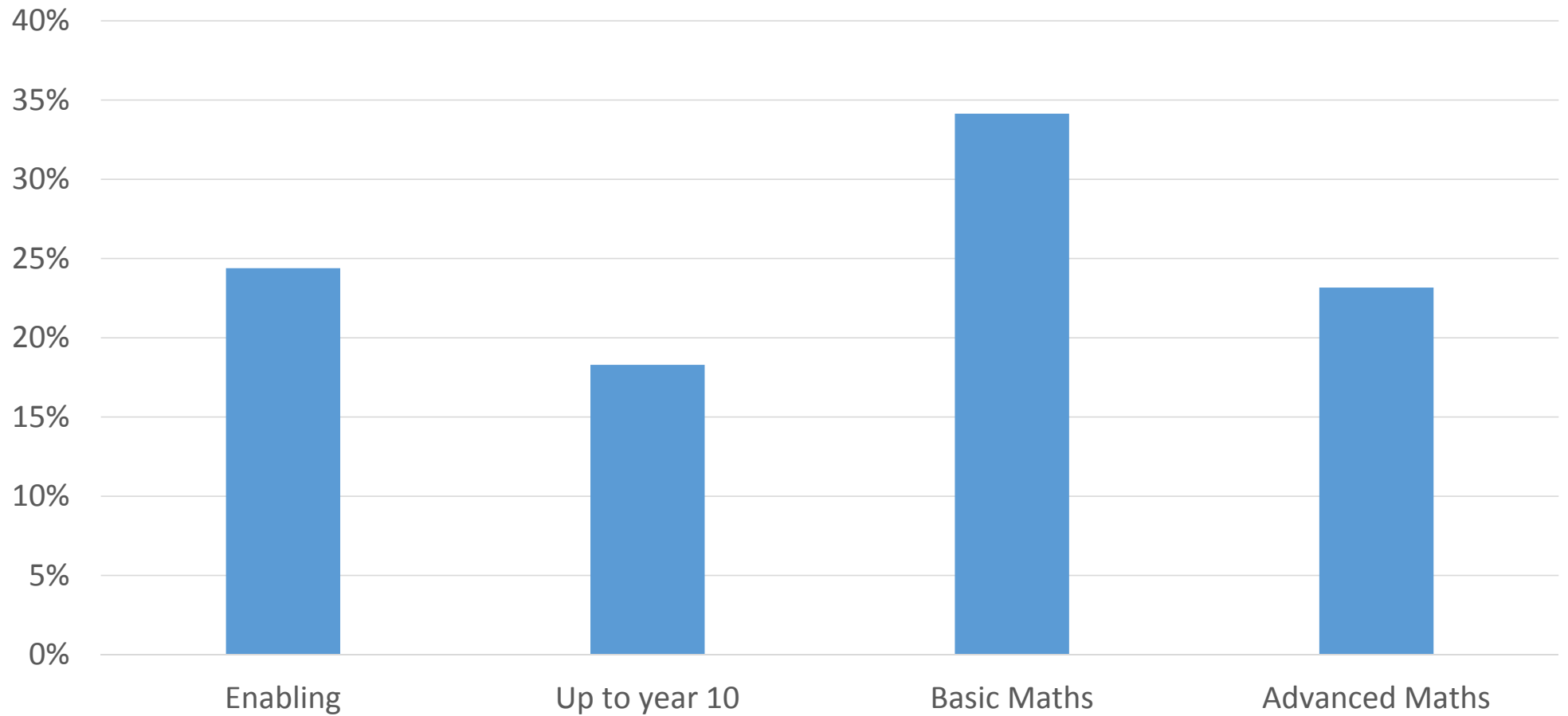
Years between pre-university maths and starting Nursing degree (n = 85)



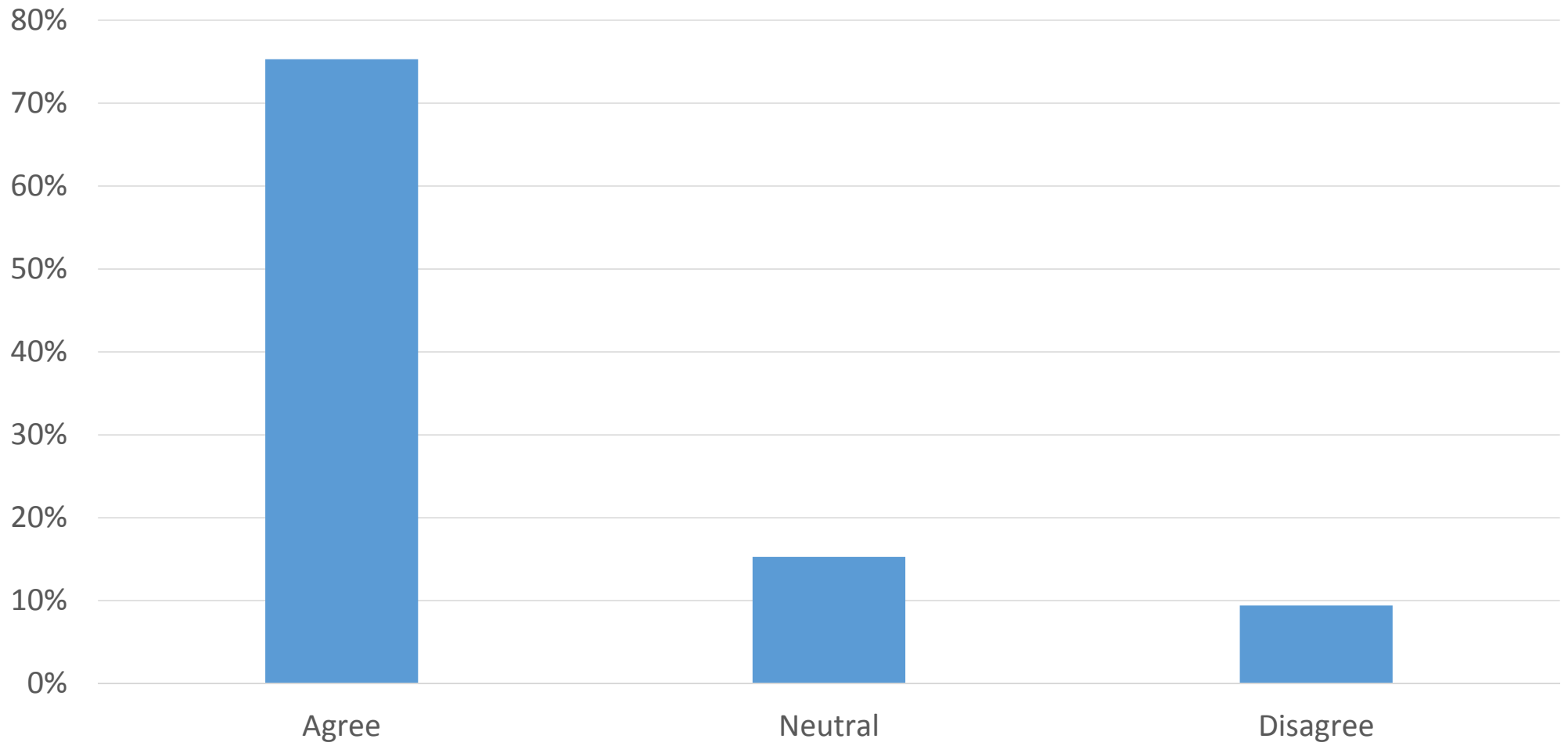
Age distribution for sample (n = 84)



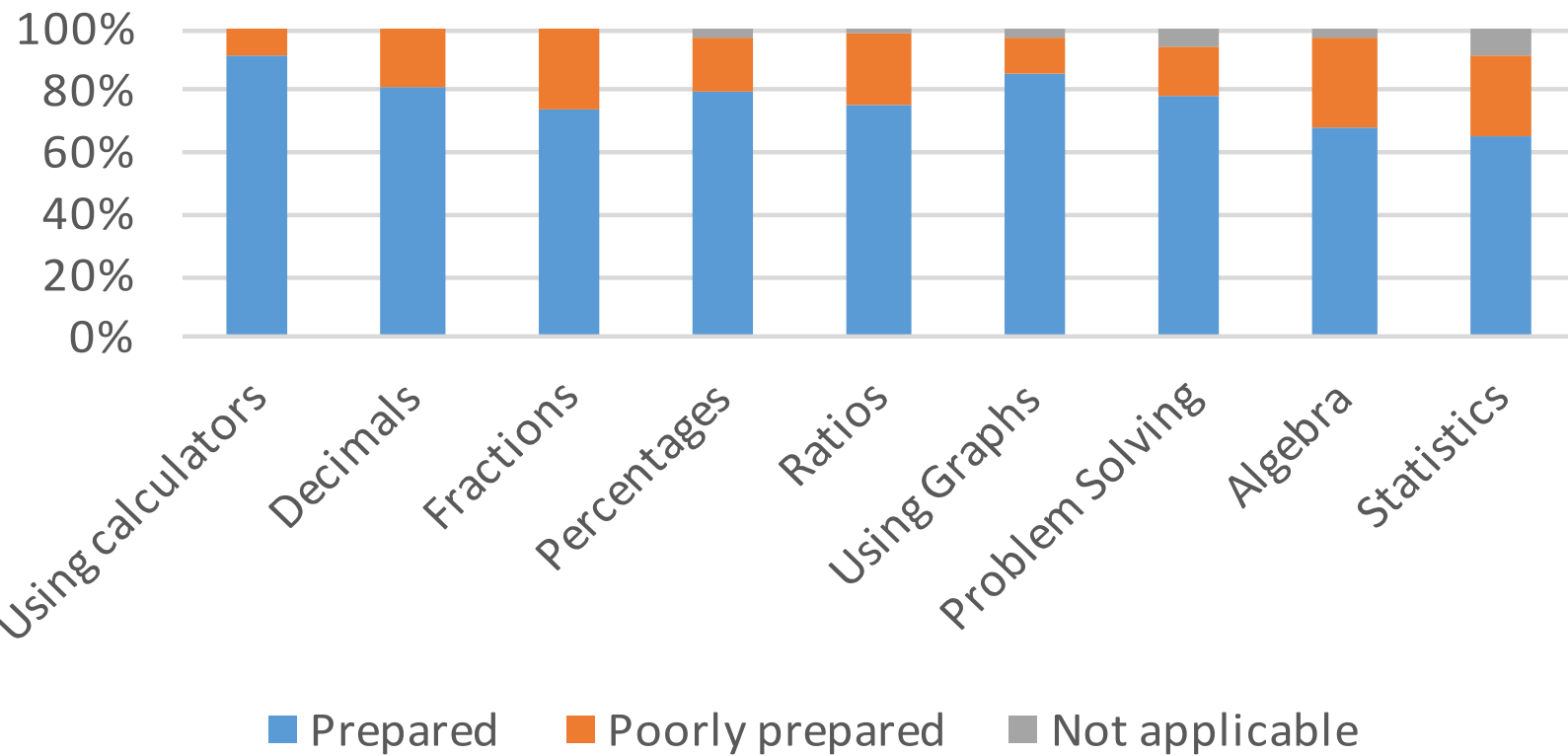
Proportion of students' pre-university maths preparation (n = 84)



Overall perception of preparedness (n = 85)



Perception for different topics



Comparison S1 & 2 2015 results of final maths quiz (44 questions)

Number of students	Total marks/44	Number of questions out of 44 with difference between cohorts		
		Diff by <5%	Diff by 5-10%	Diff by >10%
Survey/ Total	(Survey/total)			
S1 (47/403)	35.4/34.2	37	+4,-0	1 (+19%)*
S2 (26/203)	32.9/33.2	30	+4,-5	3 (+13%; -12%; -12%)

The formula for finding the amount of drug to give a patient is

$$\frac{\text{amount prescribed}}{\text{amount in each unit}} \times \text{volume}$$

On the label below, what is the volume the medication is in?

PRESCRIPTION ONLY MEDICINE
KEEP OUT OF REACH OF CHILDREN

Bricanyl[®] Elixir

* Only 7% diff in S2)

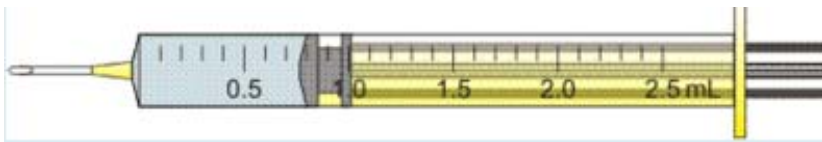
Just reading

- In previous research (Galligan 2011) up to 1/3 of errors could be due to misreading the question
- Write the following in numerals: Eighty Thousand Two Hundred and Six. For example, twenty one = 21. Note: please **do not include spaces or commas in your answer**)
- 71% correct
 - Most of the incorrect was 8206
 - One person each had 800206; 82006; 80,206; 80260 etc

Decimal reading....

Syringe measurement

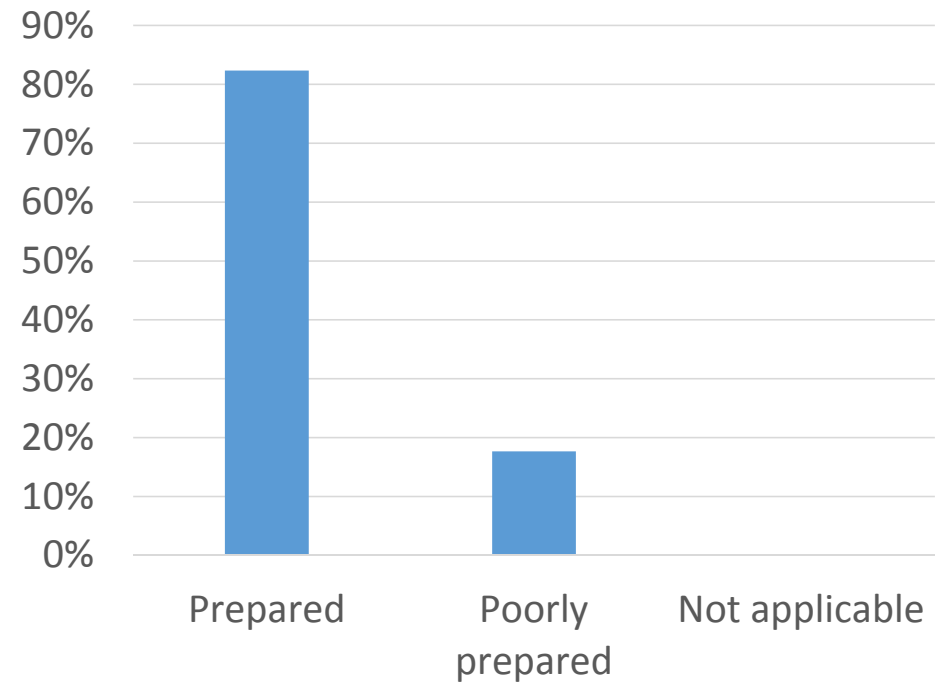
77% correct



Calculate $31.45 + 0.001$

85% correct

Decimal



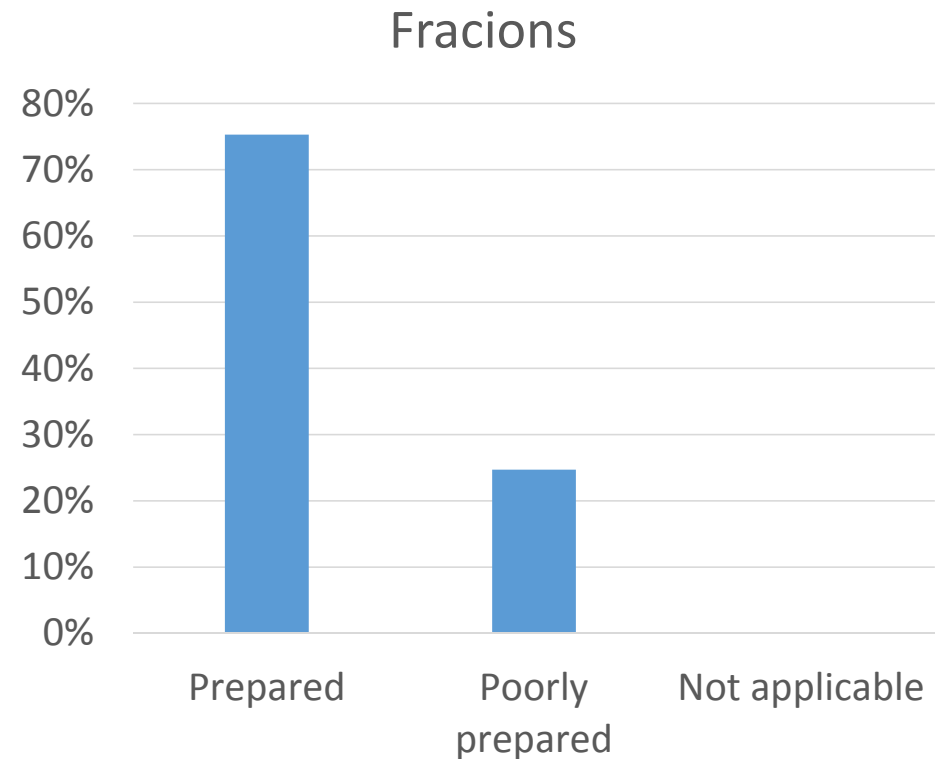
Fractions

- What is (e.g. $1/7$ or $5/8$) as a decimal

91% correct

- Express $20/120$ in simplest form

88% correct



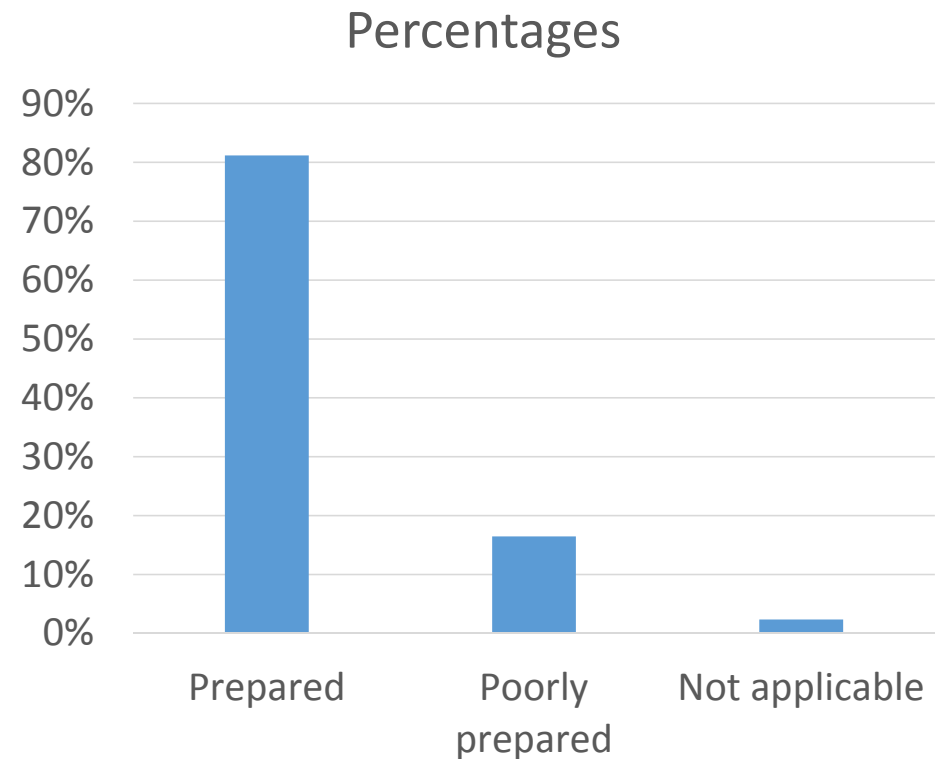
Percentages

- Find 30% of 70

89% correct

- A bag of saline solution contains 250 mL. From this bag 140 mL has been drained. What percentage **remains** in the bag?

64% correct



Percentages

- A person increased weight from 52 to 65. Express this increase in weight as a percentage of the original weight. Answer to the nearest whole number.

73%

- In a certain country of ** million people, the number of deaths from heart disease in 2008 was **. Express the number of deaths as a rate per 100 000. Answer to the nearest whole number.

58%

Ratio

A brand of milk contains 10 grams of fat per 250 mL.

How much fat is in a 1 Litre container of this milk?

(Note: please do not include units in your answer.)

92% correct

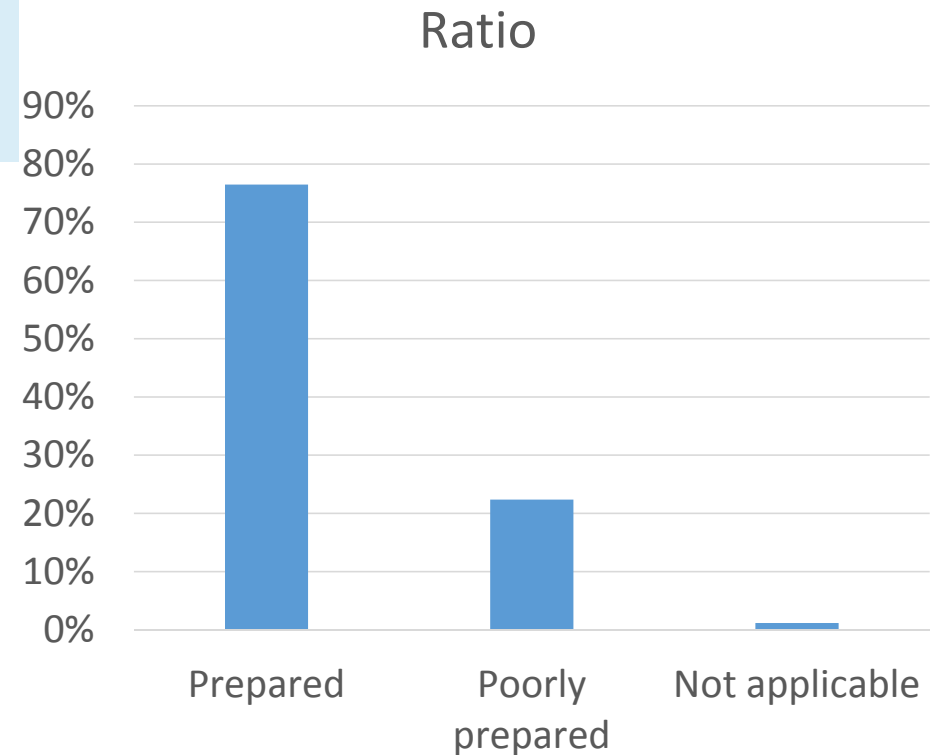
$$\frac{a}{b} = \frac{x}{?}$$

where a is a factor of x

91% correct

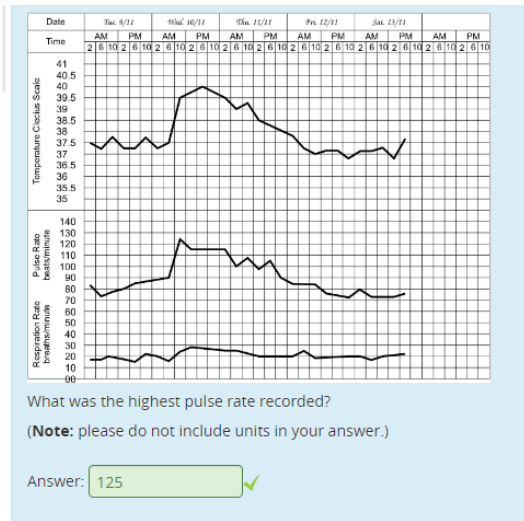
If not

85% correct

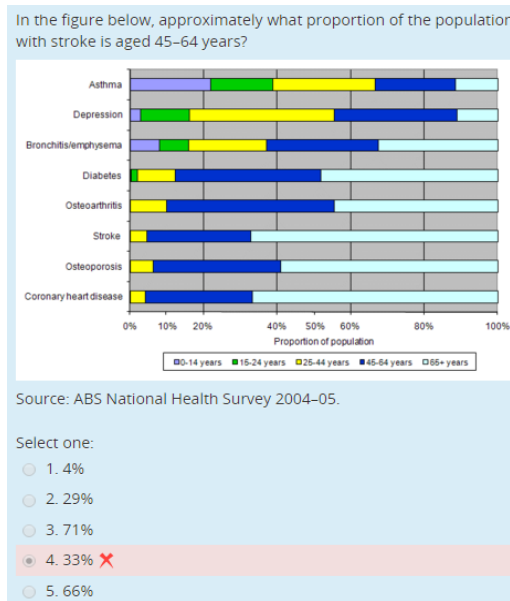


Graphs

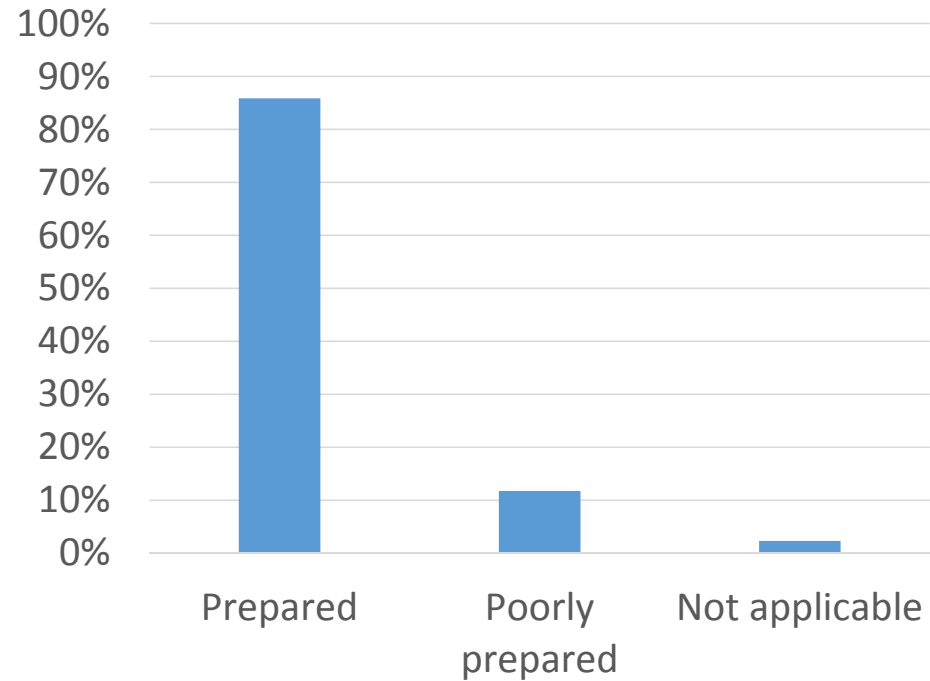
93% correct



55% correct



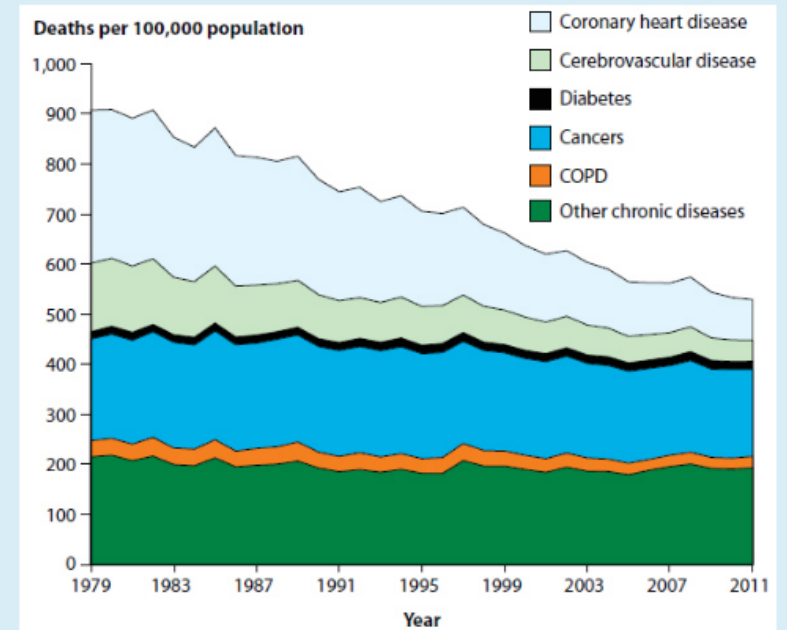
Using graphs



Tricky graph...

S1 2016
21% correct

In the figure below, approximately how many deaths per 100,000 population are caused by coronary heart disease in 2011?



Select one:

- 1. 305
- 2. 905
- 3. 601
- 4. 100 ✓
- 5. 550

Problem Solving

- 55% correct

The formula for finding amount of drug to give a patient is
 $\frac{\text{amount prescribed}}{\text{amount in each unit}} \times \text{volume}$
On the label below, what is the amount in each unit?

PRESCRIPTION ONLY MEDICINE
KEEP OUT OF REACH OF CHILDREN

Bricanyl[®] Elixir

terbutaline sulfate 0.3 mg/mL
contains no sugar
300 mL

LOT A0184
MFD APR 2005
EXP APR 2008

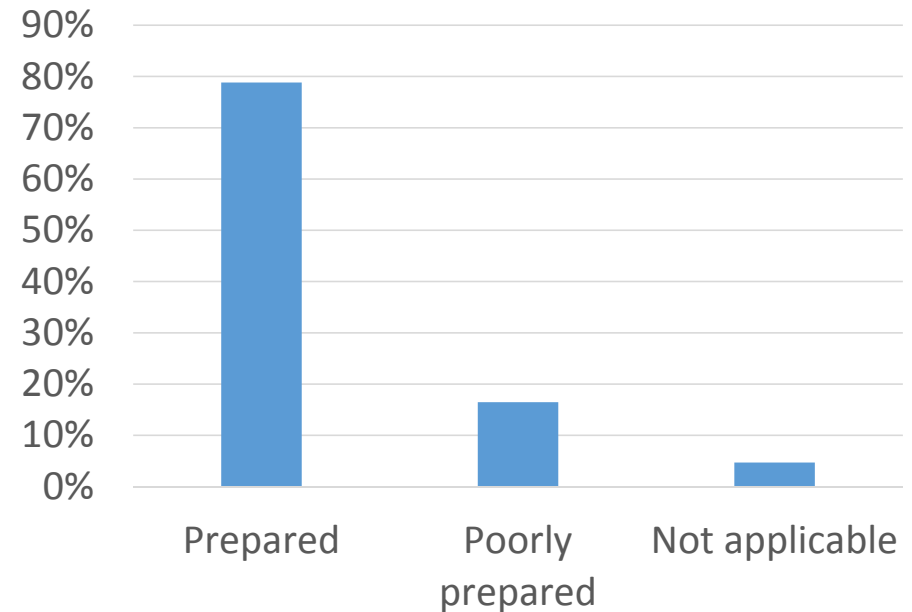
Dosage: Adults - 10 mL to 15 mL up to 3 times daily
Children - 0.25 mL/kg/dose
(Repeat as required up to every 6 hours)
Otherwise as directed by physician

ASTRA Astra Pharmaceuticals Pty Ltd
Alma Rd, N. Ryde NSW 2113 Australia

(Note: please **INCLUDE** the unit in standard abbreviated form.)

A child weighing 30 kg requires nitrofurantoin 6 mg/kg.
This medication is available as a syrup containing
5 mg/1 mL. How much syrup is to be measured out?
68%

Problem Solving



Algebra

To calculate the volume of an injection a formula is

$$\frac{SR}{SS} \times V$$

. Find the volume if SR = 322.5, SS = 30.1, V = 4.

(Round your answer to 1 decimal place.)

95% correct

If

$$B = \frac{w}{h^2}$$

what is B if w = 116 and h = 2.0?

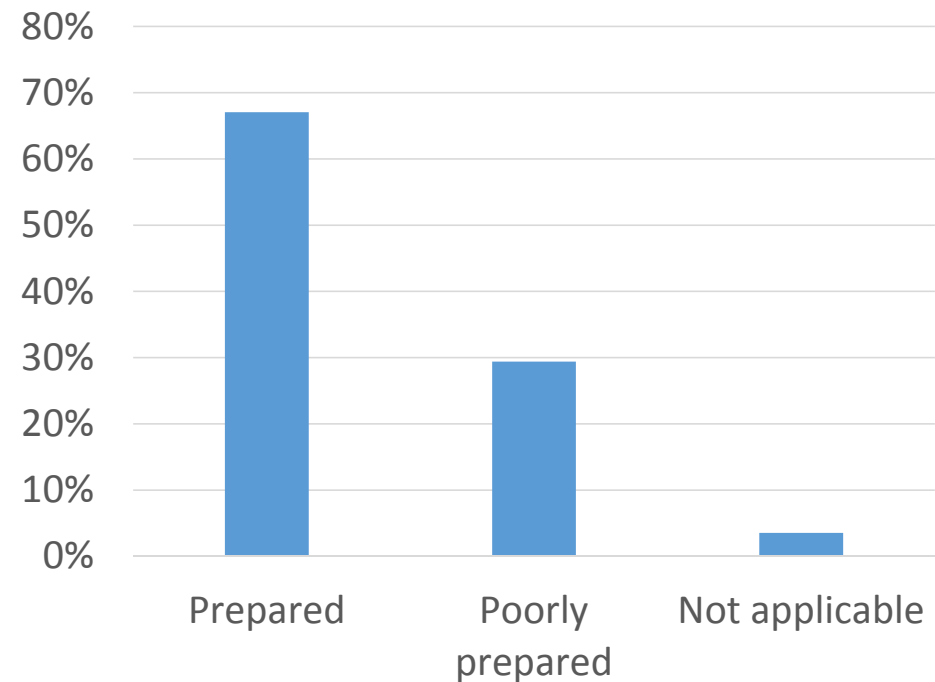
(Round your answer to 1 decimal place.)

91% correct

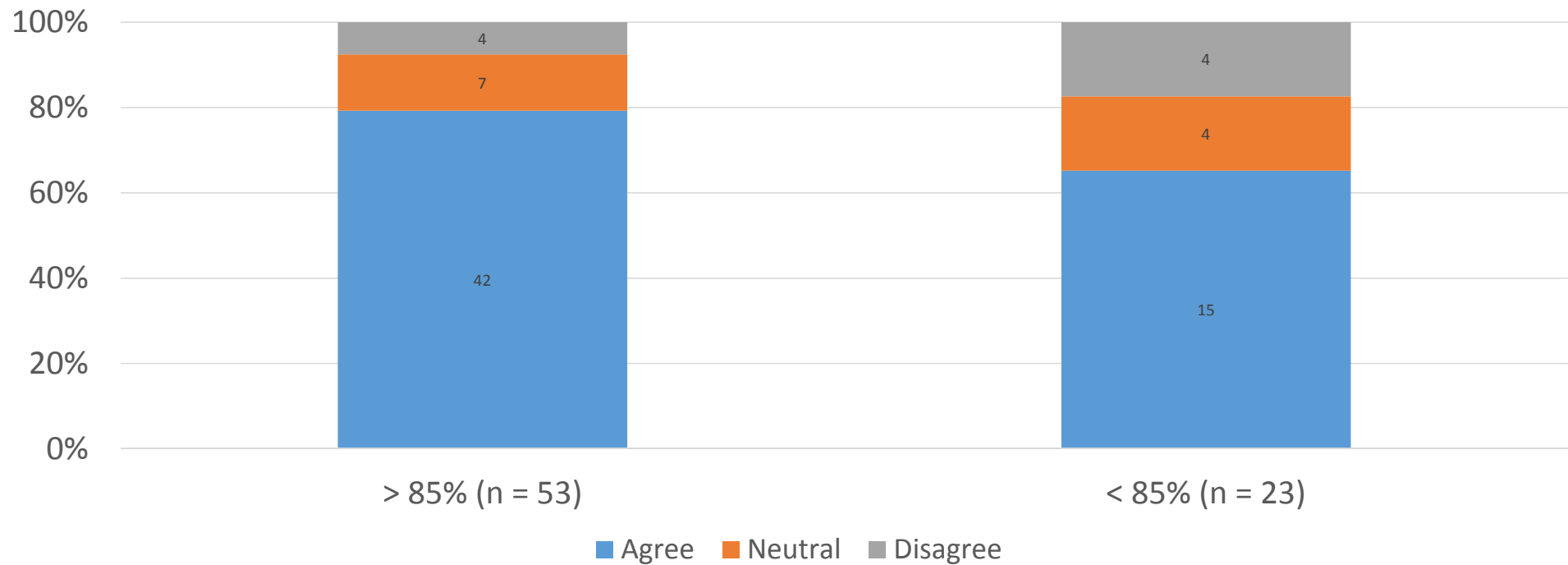
If $V = IR$ then $I = ?$

57% correct

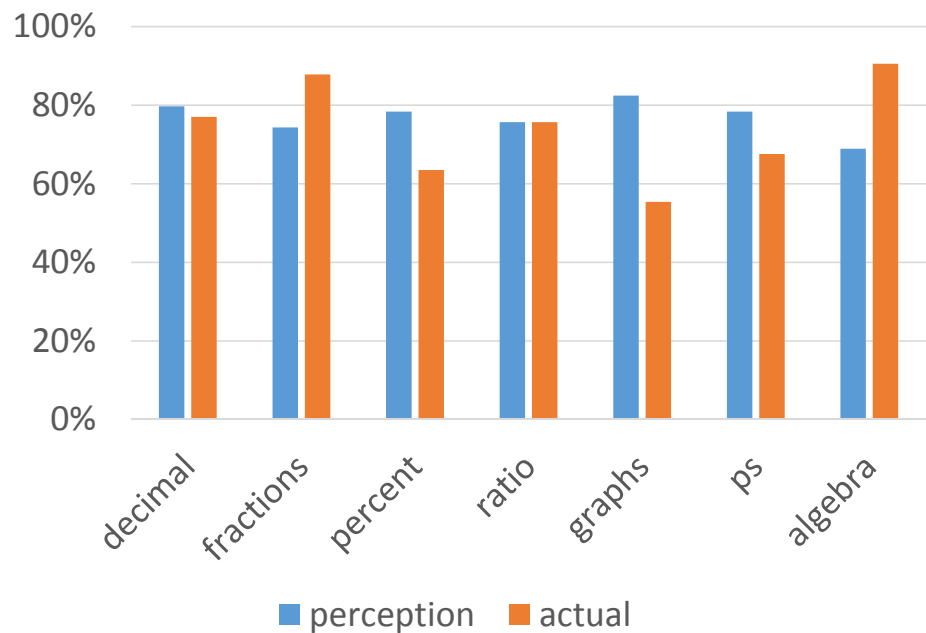
Algebra



Overall mark on final quiz & perception of preparation



Difference between perceptions and results



	Prepared	not prepared	Total
Graphing			
Correct	33 (45%)	8 (11%)	41 (55%)
incorrect	28 (38%)	5 (7%)	33(45%)
Total	61 (82%)	13 (18%)	74

	Prepared	not prepared	Total
Algebra			
Correct	45 (61%)	22 (30%)	67 (91%)
incorrect	6 (8%)	1 (1%)	7 (9%)
Total	51 (69%)	23 (31%)	74

So what's the problem...

	Student perceives they have skills	Student perceives they do not have skills
Maths results show they have the skills	1. Perceived no problem and there is no problem picked up in the assessment	3. Perceived problem but there no problem picked up in the assessment
Maths results show they still don't have the skills	2. Perceived no problem but there is a problem picked up in the assessment	4. Perceived problem and there is a problem picked up in the assessment

- Some students feel unprepared but are OK in the context
- Some students are not OK
- Students are time poor (work and study “full time”; have families) and in nursing many are females and have home/childcare duties)
- Students do not spend time on academic work
- Students do not read carefully
- Academic tests can only tell us so much:
 - There may be other questions to ask
 - ...proficiency in action is another matter