## Aims

- This week you will critically analyse some quantitative media articles. As usual, the broad concepts and techniques we cover are more important than the specific examples. Do not try to commit lots of facts to memory; instead, know **how** to do things, and **when** certain models and approaches are appropriate.

- This week, you should have completed the initial project submission. We aim to hand back the marked work next week. Now is a great time to start the rest of the project. Do not leave it until the last minute!

# 1 Questions

1. Discuss the quantitative and scientific claims in the following report, from `news.bbc.co.uk`, March 3rd, 2009. (Spend 5 – 10 minutes on this; comment on accuracy, completeness, clarity and so on.)

**TV linked to asthma risk doubling**

"Young children who spend more than two hours a day watching TV double their risk of developing asthma, a UK study has found. Rather than telly per se being to blame, experts believe the viewing is symptomatic of a sedentary lifestyle which may be the root cause. Taking deep breaths, such as when exercising, may keep the lungs fit.

The study, published in Thorax journal, tracked the health of over 3,000 UK children from birth to 11. The parents were quizzed annually on symptoms of wheezing among their children and whether a doctor had diagnosed asthma. Parents were also asked to assess their children's TV viewing habits from the age of three-and-a-half years. All of the children were free of wheeze as babies and toddlers. At the age of eleven-and-a-half, 185 (6%) of the children had developed asthma. And children who watched TV for more than two hours a day were almost twice as likely to have been diagnosed with asthma as those who watched the telly less. However, the odds were still small - about two in 100.

Of the children with asthma, 2% did not watch TV, 20% watched TV daily for less than an hour, 34% watched 1-2 hours a day and 44% watched more than two hours daily. . . . "

2. (Final exam, 2010. Worth 6 marks, so about 6 minutes to work.) Critically evaluate the quantitative claims made in the following article from the *Northern Territory News*.

*Swine flu rampant in the Northern Territory*

"More than 80 per cent of all influenza cases in the Territory are swine flu, statistics reveal. Figures from the NT Centre for Disease Control show the H1N1 virus is rampant in the Territory. The new data says the percentage of swine flu cases compared to seasonal flu increased from just 8 per cent to 84 per cent between June and July. The centre's acting director, Dr Peter Markey, said that the drastic increase occurred because most Territorians were not immune to the virus. "Normally the flu changes a little bit every year," he said. "We were worried about the (swine) flu because it has made a big change in its structure. The majority of the community hasn't got the immunity and therefore it spreads more quickly." Seasonal influenza began to climb in late May this year when surveillance increased in a bid to reduce swine flu cases. Up to 8.2 per cent of all reported cases were swine flu in the first week. But within six weeks the number jumped to 84 per cent."

3. Critically evaluate the following, from *The Sunday Telegraph*, 13/3/2010.

**Sleepy students twice as likely to crash cars**

"Young drivers who are sleep-deprived are twice as likely to crash while driving, say Italian researchers. A team at the University of Bologna collected data on 339 students aged 18 to 21. Researchers asked them about their sleeping habits and any traffic accidents they had been involved in. Eighty students had had at least one car accident, and of these, 56 per cent said they had driven while sleepy, while 15 per cent admitted that sleepiness was a prime cause of the accident..."

4. (This question was on the draft copy of the final exam for 2010, but it was removed at the last editing stage and replaced by a different question.) Critically evaluate the following statement:

   The problem with mathematics is that it treats everything as being exact. But the 'real world' doesn't follow exact equations, and nothing is certain or precise. Thus, mathematics is nice in theory, but not very useful in practice.

5. Critically evaluate the quantitative claims made in the following extract from the *Courier Mail*.

   "Drinking red wine could reduce the risk of lung cancer among smokers and ex-smokers, according to new research from the United States. Smokers who drank at least a glass of red wine daily were 60 percent less likely to develop lung cancer than non-drinkers, a study found.

   However, white wine did not reduce the risk in the same way.

   This suggests that it could be the compounds contained in red wine, such as resveratrol and flavonoids, rather than the healthier lifestyle sometimes associated with wine drinkers which offer protection, the researchers said.

   Previous studies examining the relationship between lung cancer and alcohol consumption have had mixed results. But Dr Chun Chao of health-insurers Kaiser Permanente in the US told the journal Cancer Epidemiology, Biomarkers & Prevention that much of this research failed to consider factors such as social status.

   In the current study, Dr Chao and her colleagues looked at 84,170 men aged 45 to 69 between 2000 and 2006.

   After accounting for health and lifestyle differences, the researchers found that lung cancer risk steadily decreased as red wine drinking increased.

   A two per cent reduction was seen with each additional glass of red wine a man drank a month.

   For heavy smokers, the reduction was four per cent for each glass consumed per month. "

6. (Final exam, 2009. Worth 8 marks, so about 8 minutes to work.)

   (a) The pH scale is a logarithmic scale, with a base of 10. At time 0 the pH of a solution is 8, and after 2 minutes the pH is 7. Find the **average rate of change of the concentration of hydrogen ions** in the solution over this time. Use units in your calculations.

   (b) If the concentration of hydrogen ions in the solution is changing at a linear rate, at what time will the solution have pH equal to 5?

7. Estimate the total number of words spoken by members of the Australian population each year. **Use units in your calculations and clearly state any values you assume.**

8. We are now in Week 6, so are almost half way through semester. Now is a good time to look back at the work we have covered so far, and ask your tutors if you have any questions or if anything is unclear. If you don't have any questions then do some work on your project.

**The end**