I have recently designed and written a program for the Unit which allows results from an individual school survey to be compared with answers from the district survey of which it is part.

School and district books

Schools using our secondary behaviour survey service all receive a bound book of tables which includes the responses to questions by young people in their school. Increasingly, schools using our survey are taking part in area-wide surveys, sponsored and supported by LEAs or District Health Authorities, or preferably a combination of the two. A similar book will then exist which contains the percentage responses for the whole district survey. It is of obvious interest for a school to compare the two.

We have recently developed and trialled a reporting service which has been designed to perform this comparison procedure for schools, in order to highlight areas of difference where schools have taken part in district surveys. This we believe will provide a clear and stimulating initial agenda for discussion, and promote more detailed examination of the books of data received as part of the basic service from the Unit.

A program has been written to extract and print out all the responses to questions where the rate of response from students from a given school is more than 10% different to the rate from the whole district survey (including that school). The resulting printout looks like Figure 1.

This article summarises points that have been raised by and discussed with schools who have used this exercise.

Thumbs up

We were delighted to receive so much positive feedback from schools

GEORGE FOOT

How typical is your school?

about their comparative reports (see right for typical comments).

Areas of the curriculum that received renewed attention included:

AIDS
Exercise
Diet
Hygiene

All summaries I suppose produce distortions. I offer some thoughts below on aspects of the particular exercise in summarising that is the community profile report.

More of less is more

There is a problem of 'double negatives'. If this data is used with young people or parents, they may need help in realising that an entry which gives your students doing homework last night for 'NO TIME' as 15%, and students across the district as 25%, indicates that your students did more, not less, homework on the night before the survey.

How big is 10%?

All entries are based on percentages. A difference greater than 10% sounds a lot, but it may be important to translate the percentage back into integers. So, if a school surveyed 50 boys in a given year group, 10% represents 5 boys, if all 50 answered that question. However, if fewer than 50 boys answered the question, 10% may be equivalent to fewer than 5.

How to discover when your pupils' rate of response is more than 10% different from the whole district survey

Typical comments would be:

- Led to a lively and positive staff meeting – very worthwhile exercise.
- Some caution needed – but very interesting data.
- Very good stimulus to development of school policy – it highlighted very clearly areas where we should pay more attention.
- Look forward to doing the survey again.
- Significant use by year tutors led by heads of year.
- Led to immediate plans to change the year 10 programme.
- Governors received the data with interest – and thought it was an important thing for us to be doing.
- Enabled us to see our school in the perspective of the whole district.
- Used as part of in-service work with tutors.
- The report led us back to examine more closely the original book of tables.
- We used the report with pupils to see how they reacted.
- Not unexpected results on the whole but still useful to see the evidence.
- We plan to use some of the results with parents – after all, many of the questions touch on life in the home.
- Do get back to us later – paperwork looms but I anticipate spending some time considering this report.

On the other hand, the 50 boys in the sample may be nearly all the boys of that age in that school, so there is greater confidence in the accuracy of the figures in terms of how well they represent the school population. Certainly an extra 5 smokers in 50 is a substantial group in any event.

10% of how many?

Answers for just one or two questions are not usually based on the whole sample as the denominator for the percentage. For example, income figures are based only on those who have a job, and the 'sources of alcohol' figures will be based only upon those who have had an alcoholic drink last week. Reference to the questionnaire, and to the original books of data, is advisable in these cases.

Possible complacency?

Schools may be reassured by this exercise in that their school is no worse and may be better than the whole district for, say, smoking rates. This would be unfortunate if the school then decided to rest on their laurels, for on health grounds they still have a problem which may require action.

We were a little anxious about this but apparently without need. Several schools mentioned that *other* schools might become complacent if they got 'good' results, but they were still keen to do even better!

Topics vs. the whole person

There is a persistent problem with all detailed survey work of this kind: it may produce the sort of close focus upon which concrete plans may be laid, but it may promote a topic-based rather than a whole-person approach to health education. Without making an explicit judgement, we may be promoting the topic approach.

The commitment to a more holistic approach to health and social education by teachers and tutors seems substantial enough to resist this hint.

Whose responsibility?

The results are school-based but the behaviours reported are largely practised out of school. Schools undoubtedly have a role to play in promoting health within a community, but no particular credit or blame should be attached to a school for the behaviour of the community which it serves.

Winners or losers?

In a community of average characteristics, with a given proportion of middle- and working-class families and a given cultural mix, we might expect a certain rate of a particular health-promoting behaviour – let us say15% who exercise regularly.

Clearly, schools who obtain lower-than-average exercise rates (say,

Printout results

				Verbal summary
1.	+10.8%	Visited their doctor more than one year ago.	1.	*The lower percentage of pupils who have visited their doctor recently is encouraging, or does it reveal a hesitancy to go? (See other data: At ease)*
2.	-18.8%	Needed to have fillings at the dentist on their last visit.	2.	*The lower number of pupils needing fillings indicates healthy teeth.*
3.	-11.9%	Have ever tried to lose weight.	3.	*The number of pupils wishing to lose weight is below that of the other participating schools.*
4.	-22.3%	Never or rarely drink skimmed milk.	4.	*A lower percentage never or rarely drink skimmed milk, and so it may be assumed that a high percentage do.*
5.	+10.3%	Don't worry about AIDS.	5.	*A higher percentage do not think about AIDS, why?*
6.	+16.7%	Have spent money on clothes in the last four weeks.	6.	*There is a higher level of those spending money on clothes recently at this school compared with the district result.*
7.	+10.7%	Have spent money on pets in the last four weeks.	7.	*There is a higher level of those spending money on their pets.*
8.	+19.3%	Have spent money on cigarettes in the last four weeks.	8.	*The higher percentage of smokers is worrying.*
9	-11.1%	Have spent money on school items in the last four weeks.	9.	*A lower percentage purchase their own school equipment.*
10.	+24.3%	Have spent money on slot machines in the last four weeks.	10.	*The higher percentage of gamblers gives cause for concern.*

The survey co-ordinator may find that verbal summaries of their results are helpful to colleagues.

Results for a school, showing some percentage differences to the average district values for year 10 pupils.

10%) within a catchment area which exercises at a much-lower-than-average rate (5%) may be said to be doing better than schools who obtain only higher-than average rates of exercise (20%) from a community which has a rate very-much-higher than average (25%).

Teachers who have followed debates about publication of school results will not need reminding of this! (Obviously, we never release school survey results ourselves.)

How different is different enough?

We are often met with the challenge: are these 10% differences significant? That is, are they likely to represent 'real' differences between the school sample and the population sample, or could they be due to chance? This is not straightforward to answer. We should say straight away that any pattern of results could be produced by chance alone. What can be discussed beyond this, is how likely is a given difference to be due to chance? What is the best guess? Schools may have sources of evidence available to them locally which confirm the profile indicated by the comparison, but we can adopt a mathematical approach to this issue.

Representative data

Firstly we need to know how representative the samples are. A school should know how representative its sample was, and as a rule all survey schools work hard to make the sample as representative as possible. If all schools in the district took part in the survey, then the whole sample will be very representative of the district; if not all schools took part, then the more representative of the district these schools are, the more reliable the data will be. These considerations are hard to quantify.

If the question of representativeness is resolved, it is possible to be very precise about how big a difference is big enough.

There is a standard calculation used with percentage data, where we can derive the *standard error* of the proportion. For a figure of 8% from a sample of 100 year 8 girls, the *standard error* works out at ±5%. From this we can say that although the actual incidence may not be exactly 8% we are 95% certain that it is between 3% and 13%. If the regional figure were 20% you could be very confident that your school rate was lower.

[*If you wish to go into the statistical implications more deeply, see box below. – Ed.*]

Conclusion

This service has been well and positively received by every single school who has responded to us. Schools seem well aware of possible mistakes that hasty interpretation might produce, and welcome the direction and motivation that this short summary produces.

Contact George Foot, c/o The Schools Health Education Unit, University of Exeter (0392 264722).

For statisticians only: confidence in the data

This *standard error* is not always ±5% and depends on various other factors:

(a) The larger the *absolute* size of the sample (ie the 100 girls), the smaller will be the standard error.

(b) The larger the *relative* size of the sample, the smaller will be the standard error, (for example, if the 100 year 8 girls are drawn from a total of 120 year 8 girls in the school).

(c) The *standard error* is largest when the percentage is 50%, and the error will decrease if the percentage is greater or smaller than 50%.

On this basis it is possible to calculate the exact degree of confidence in the data. For example, if 8 out of 100 year 8 girls smoke (8%), and the district survey shows 13% of year 8 girls smoking out of a total survey of 800, are these percentages significantly different? If this was all we knew, then according to the *standard error* calculation above (±5%) then the school rate could be as high as 13% and we obviously cannot conclude that the school rate is lower. But from (b) above, we might have more confidence in our data than that. Suppose that the total school population of year 8 girls is indeed 120, and the 800 are drawn from a district total of 1500. In this case the expected error in the school figure is 2%, and that of the district figure is 2%, and we can say that the school rate very probably is lower.

(There is a further correction that should be made. The estimate of the district incidence would be based on a sample which includes the students from our selected school. It is possible to make an adjustment to the district figures based on this knowledge, and in the example given, our estimate of the district rate is affected and rises to 14 of the confidence interval remains 2%. This does not affect our overall conclusion of real difference.)