

# The Disease Detectives

Outbreak Epidemiology  
for the rest of us



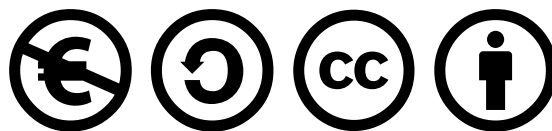
A comic  
by Esther  
and Florian

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It's summertime; school holidays have just begun and Michael, Lucy and Thomas, neighbourhood friends, want to go to the park to play football. Michael and Thomas are twelve, Lucy eleven.

I'm only playing if Luca is in my team; otherwise I have no chance against you two.

OK, although I haven't seen him for a while. He wasn't at school yesterday. Maybe his family are already on holiday.

They ring Luca's doorbell. His mother opens the door.

I'm sorry, but Luca has been ill for two days. He has a bad stomach ache and a bit of a temperature.

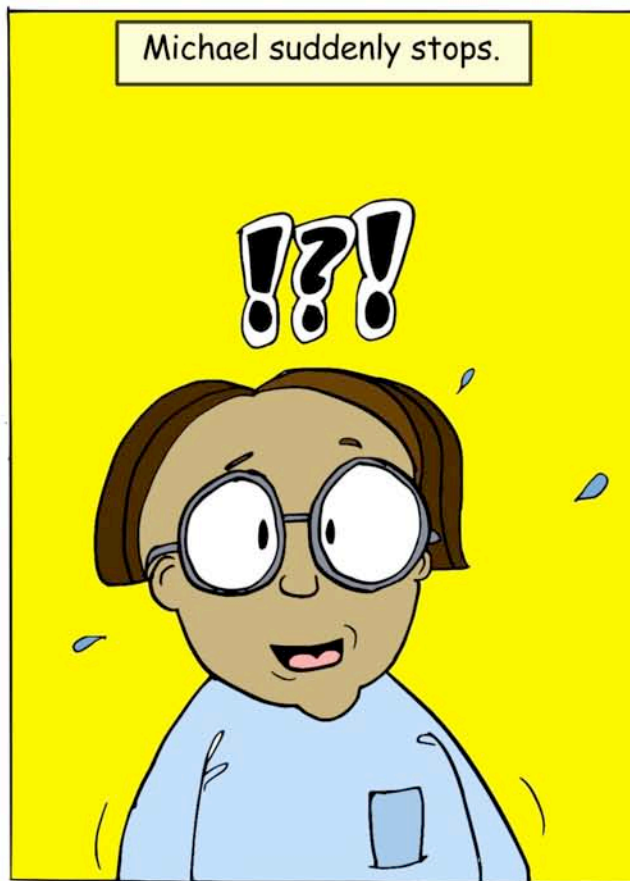
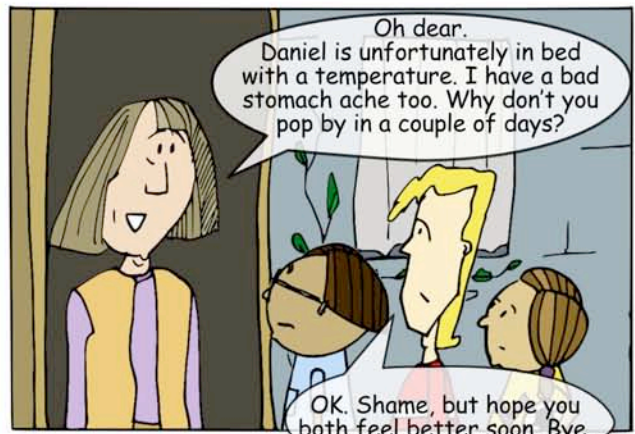
He would have loved to play football with you. Maybe he will feel better tomorrow.

What a shame. We hope he gets well soon.

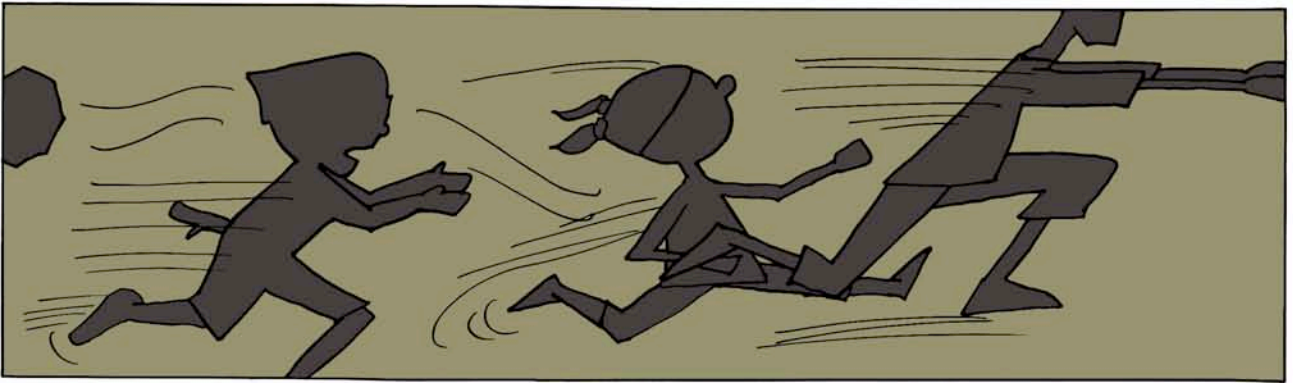
Poor Luca. What shall we do now? And who'll play in my team?

I know who! Daniel will play. He scored a great goal in P.E. class recently. He lives over there.











Michael and Thomas are sitting on the terrace of the ice cream parlour, getting over their fright.

GELATI

Everybody wants the new blackberry-yoghurt ice cream. We got the last bit.

It's really good. I've never had such tasty ice cream before.



I once ate 5 scoops of ice cream - I got a bad stomach ache afterwards.

Say that again!



I once ate 5 scoops of ice cream: chocolate, vanilla...

I had a stomach ache?

No after that!



What if Luca and Daniel ate too much ice cream and are now sick?

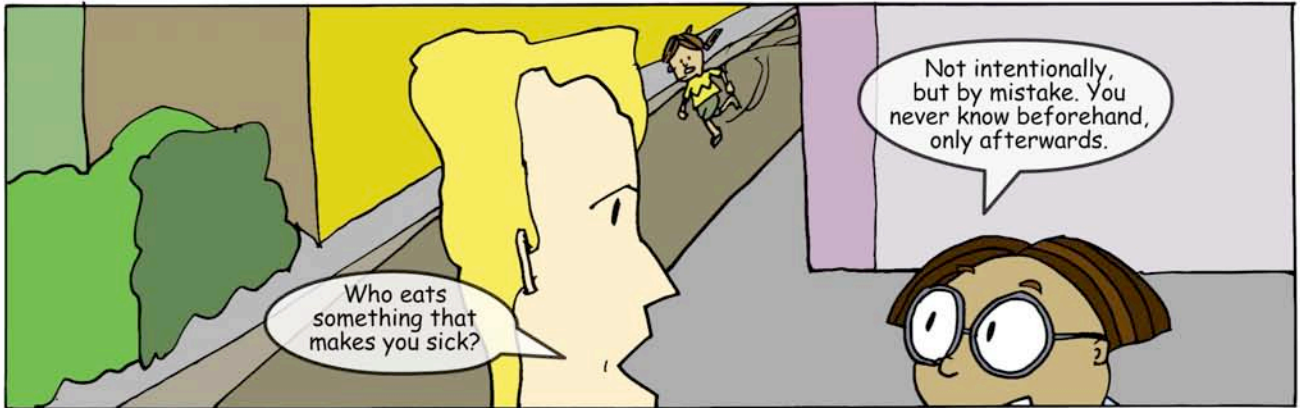
Impossible. Daniel's mother would never allow that. And she got ill too.



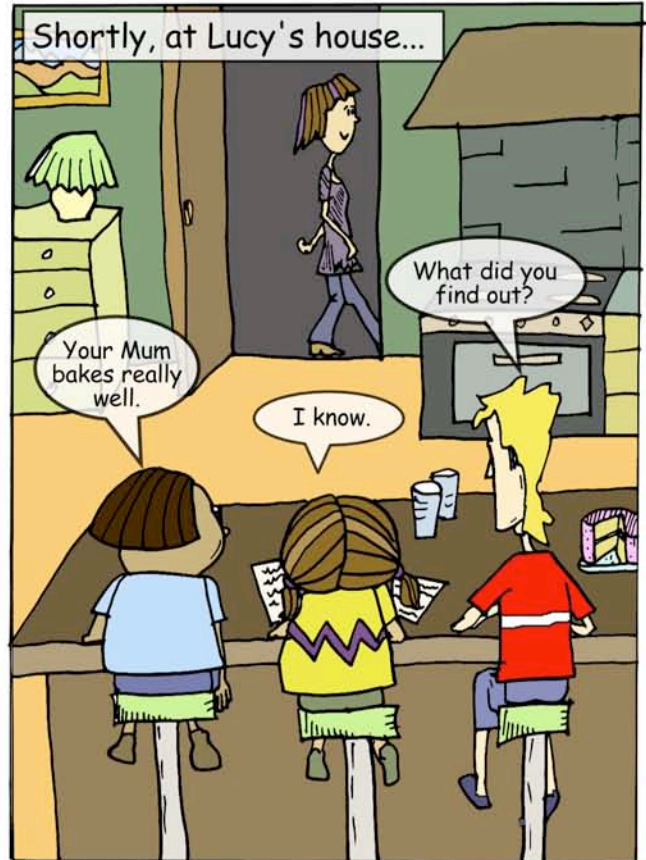
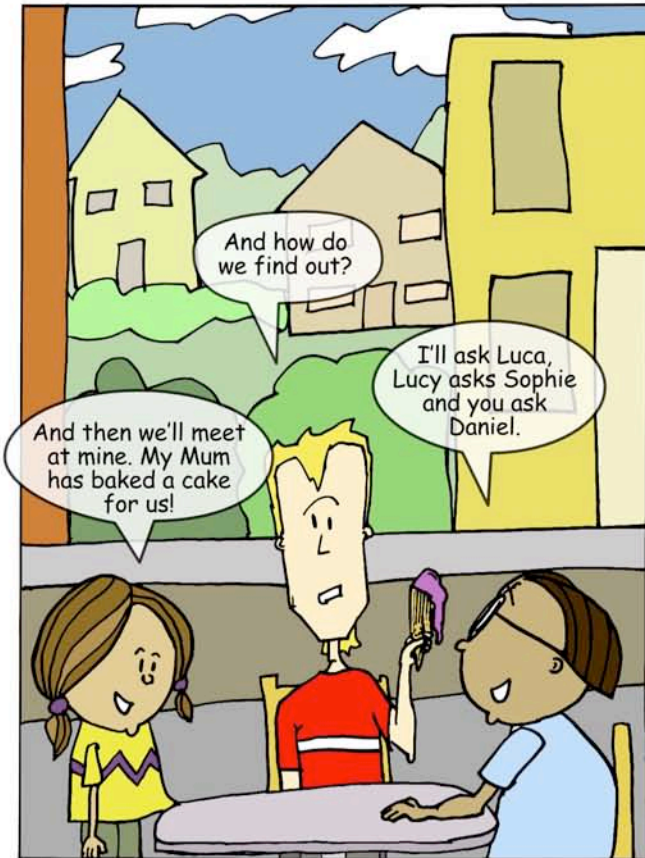
OK, but what if all three ate the same thing. Something that made them sick?



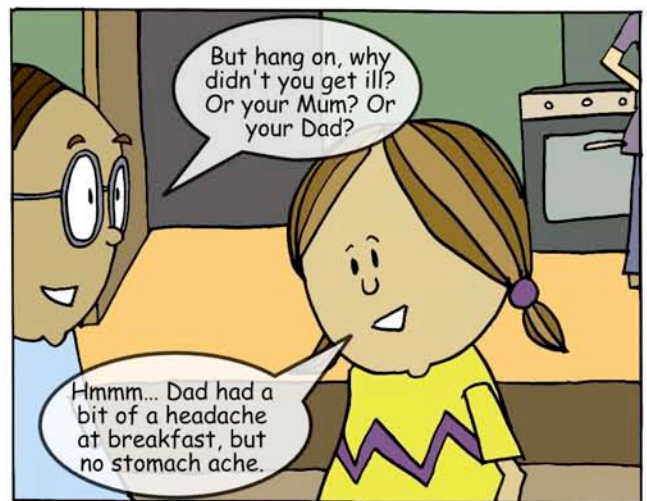


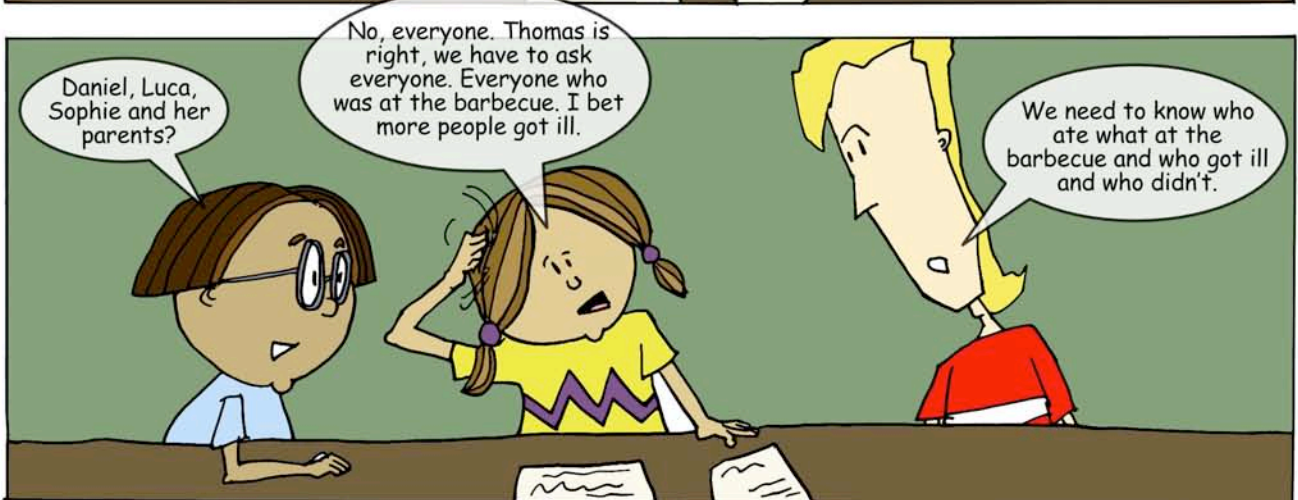




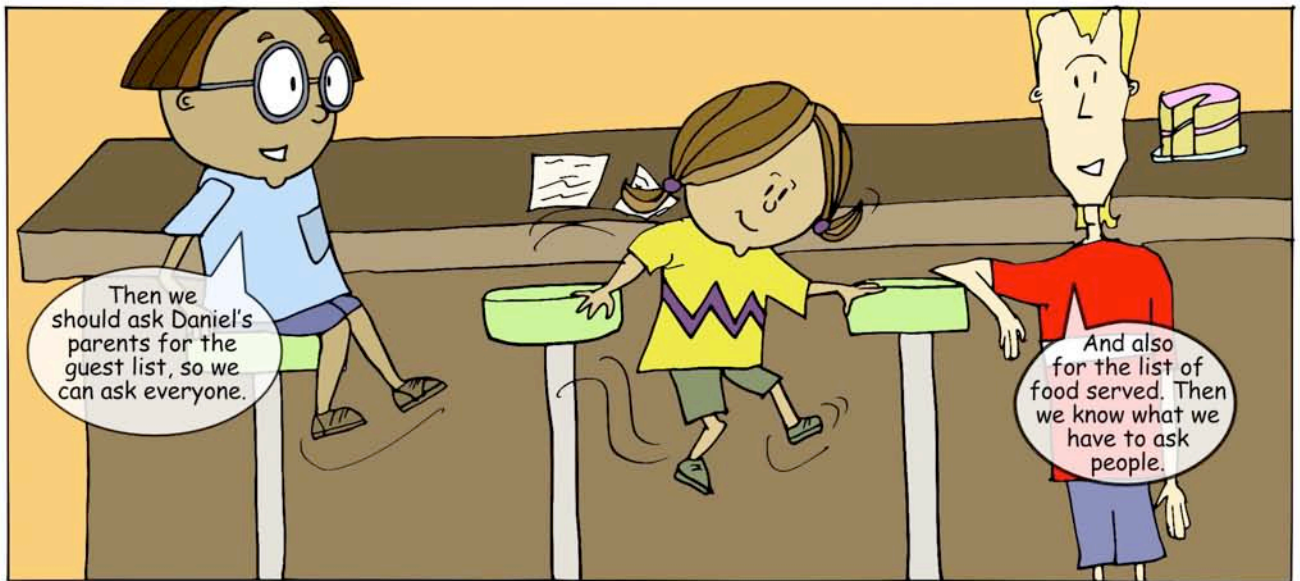
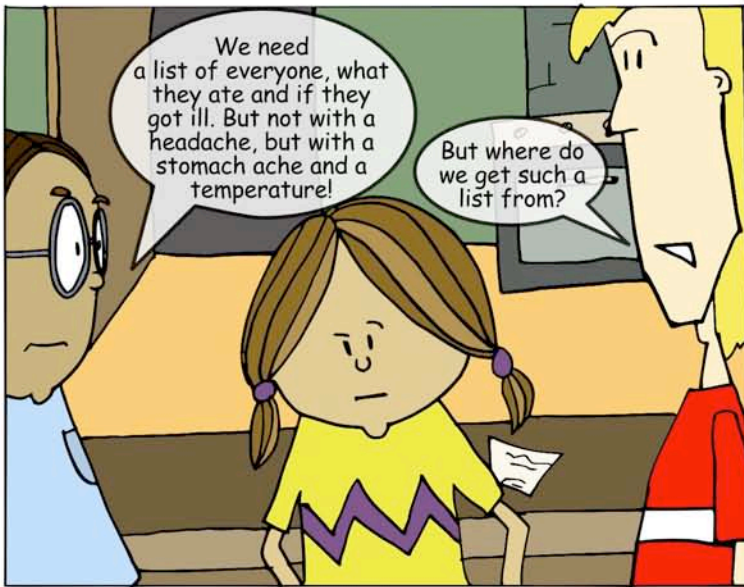














And so Lucy, Thomas and Michael went to Daniel's house again to ask his mother for a guest and food list and of course to send their wishes for a speedy recovery to their friend.

Then they called on all the neighbours that were at the barbecue and asked them what they ate at the party and if they got a stomach ache or a temperature afterwards.



In the evening:

That was hard work. But the list is finished.



Name	Eaten	Ill?	When ill?
Luca	Hamburger Potato Salad Cheesecake Orange Juice	stomach ache	Sunday
Daniel	Hamburger Tiramisu Sausages Tap Water	stomach ache fever	Sunday morning
Lucy	Sausages Tiramisu Lemonade	not ill	not ill
Sophie's sister	Hamburger Noodle Salad Apple Juice	fever, stomach ache, hospital!	Monday

I'm tired, I'm going home. See you tomorrow.

OK, see you tomorrow. Where shall we meet?

We can meet at mine after breakfast. I'll take the list home. See you tomorrow!





A new day dawns. Lucy and Thomas are at Michael's who greets them wearily.

Good morning Lucy, hi Thomas.

Hi Michael. You look really tired.

Did you watch TV till late last night?

No, but I was thinking about our list and couldn't fall asleep. And then I suddenly had an idea.

If we turn the list around and we count how many people ate each food item and how many people got ill...

....then we only have to compare that with the number of those who got ill, but did not eat the food item!

And then we know what made everyone ill!

Look, it's easy: our old list had a line for each adult or child, what they ate at the barbecue and if they got ill.

Name	Eaten	Ill?	When ill?
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Daniel	Hamburger Tiramisu Sausages Tap Water	stomach ache fever	Sunday morning
Lucy	Sausages Tiramisu Lemonade	not ill	not ill
Sophie's sister	Hamburger Noodle Salad Apple Juice	fever, stomach ache, hospital!	Monday

I was thinking that most of the ill people will have eaten the same bad food, while those who didn't eat the bad food probably have stayed well.

So, the new list has a little table for each food item. Here for example is the hamburger table.

First I count how many people ate hamburgers and how many didn't.

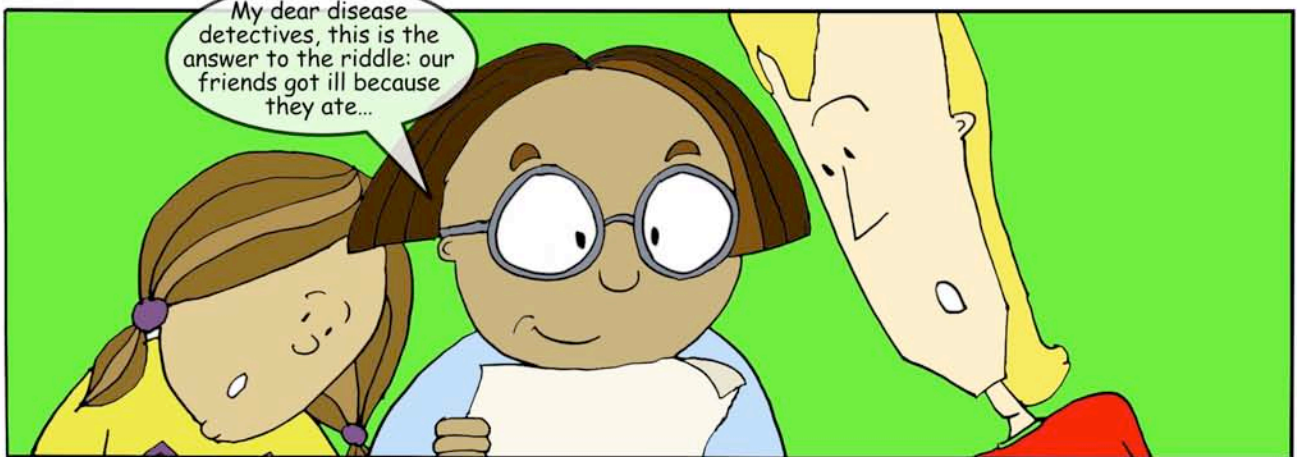
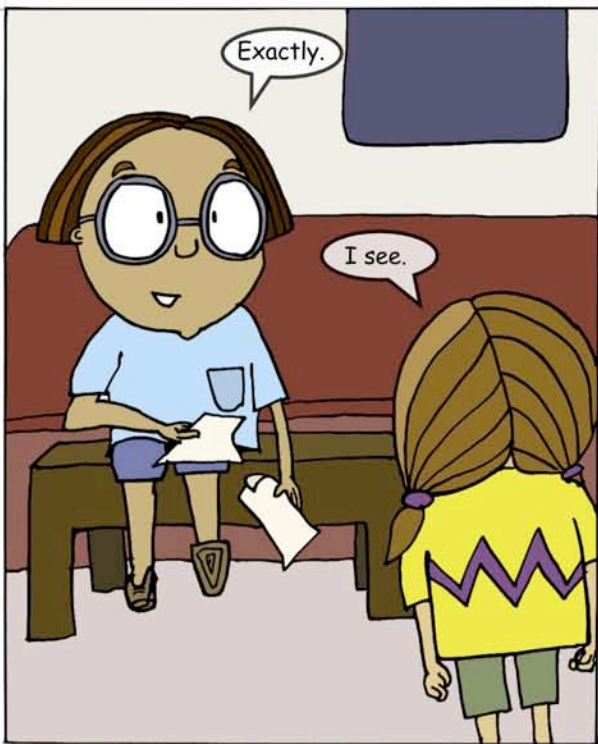
Then I count how many in each of these groups got ill.

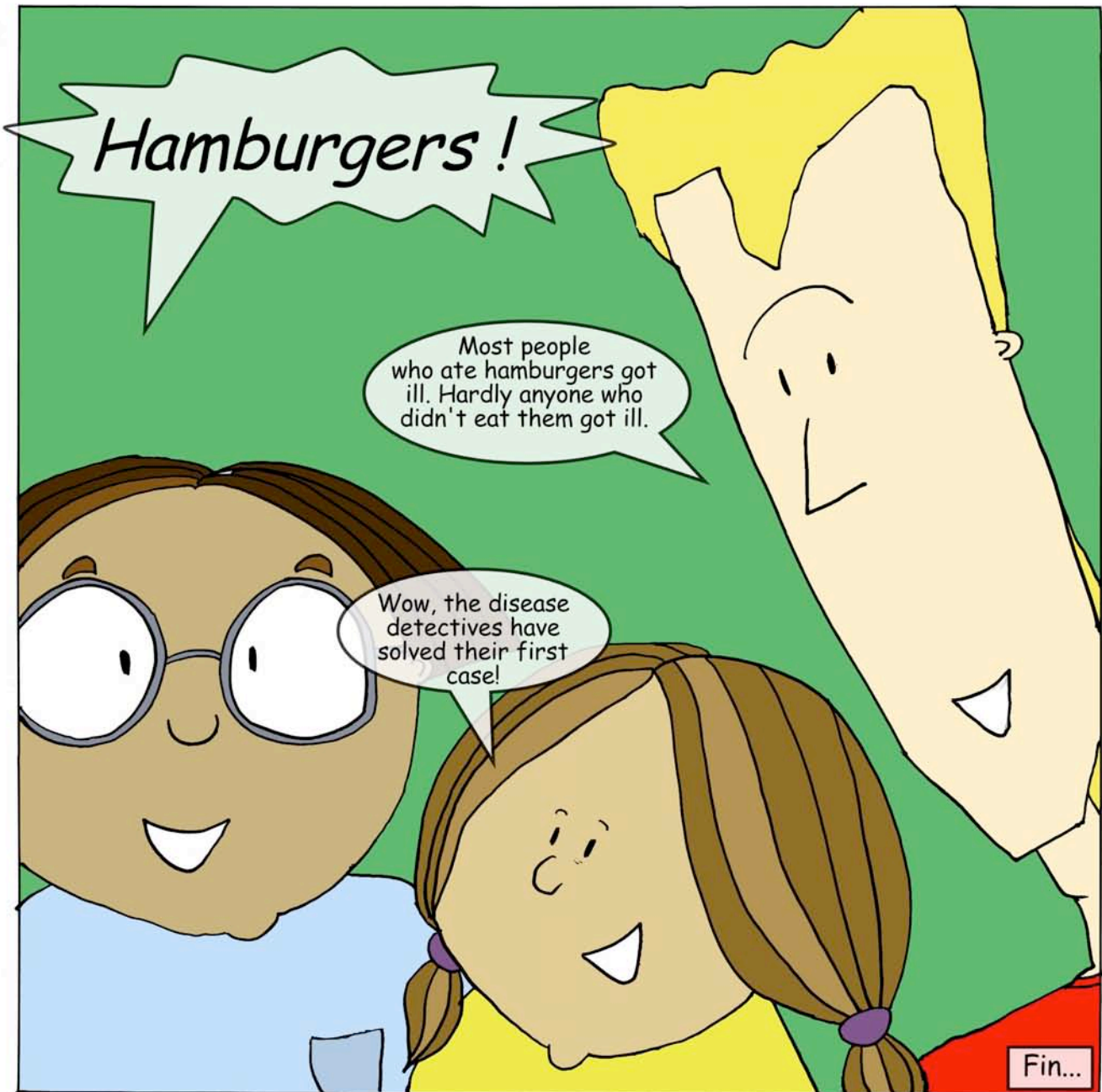
Here for example, twelve of the 18 guests ate hamburgers whereas six did not eat hamburgers.

Out of the 12 people who ate hamburgers, ten got ill. Out of the six people who didn't eat burgers, only one got ill.

	ill	not ill	added (total)
ate hamburgers	10	2	12
did not eat hamburgers	1	5	6







#### Epilogue:

Shortly afterwards Sophie's sister in hospital was diagnosed with a Salmonella infection. Salmonella are harmful bacteria that can cause bad stomach aches and also a temperature. You can get them from bad or improperly prepared meat.

When the district health unit was trying to find out the cause of the infection, Michael, Thomas and Lucy had already solved the case. With their clever ideas and driven by the wish to help their ill friends, they found out that the hamburgers at the barbecue were unfortunately bad.

Daniel's mother still had some minced beef left over, that she had made the burgers from. In a special laboratory Salmonella bacteria were found in the meat.

The district health unit then asked the supermarket, where Daniel's mother had bought the meat to take the bad mince off the shelves.

This way, no one could buy the bad meat anymore and get ill from it.



