**Hospital**

**Many epistemic actions**

Dr Jones works as doctor in a local hospital. Dr Jones often administers her patients the blood-thinning drug “Heparine” in order to prevent thrombosis and blood clots. Normally, blood-thinning drugs do not cause any side effects with certain blood types.

The hospital has recently started to order an additional blood-thinning drug, “Afibo”, that is cheaper than “Heparine”. “Afibo” is as effective as “Heparine”, but has one side effect. It causes mild leg cramps in patients with blood type ‘AB-positive’.

However, the fact that “Afibo” causes mild leg cramps in patients with blood type ‘AB-positive’ is still unknown. A standard procedure for hospitals is to let a specialised lab carry out a few tests on a new drug. Only a specialised lab can carry out the test that tests for a drug’s side effect with certain blood types.

This test for side effects with certain blood types is very insensitive. Statistically, only 1 out of 10 tests detects “Afibo”'s side effect with blood type ‘AB-positive’. How sensitive the test is is known to all doctors.

Ten of these tests have been carried out on “Afibo”. Nine tests result are negative, but one test finds evidence for the side effect. Each test result is sent to all doctors of the hospital in a separate e-mail (see Figure 1).

Table

Description automatically generated

**Fig 1.**The e-mails 1-10 each contain the result of one of the ten conducted tests.

Dr Jones looks into Email 1 and checks the test result. The test result in this e-mail is negative, showing no evidence for the side effect with blood type ‘AB-positive’.   
  
Dr Jones does not look into the other nine e-mails.

As a result, Dr Jones does not know that “Afibo” causes mild leg cramps in patients with blood type ‘AB-positive’.

**Hospital**

**Few Epistemic Actions**

Dr Smith works as doctor in a local hospital. Dr Smith often administers her patients the blood-thinning drug “Sanguin” in order to prevent thrombosis and blood clots. Normally, blood-thinning drugs do not cause any side effects with certain blood types.

The hospital has recently started to order an additional blood-thinning drug, “Corus”, that is cheaper than “Sanguin”. “Corus” is as effective as “Sanguin”, but has one side effect. It causes mild leg cramps in patients with blood type ‘B-negative’.

However, the fact that “Corus” causes mild leg cramps in patients with blood type ‘B-negative’ is still unknown. A standard procedure for hospitals is to let a specialised lab carry out a few tests on a new drug. Only a specialised lab can carry out the test that tests for a drug’s side effect.

This test for side effects with certain blood types is very sensitive. Statistically, 9 out of 10 tests will detect “Corus”’ side effect for blood type ‘B-negative’. How sensitive the test is is known to all doctors.

Ten of these tests have been carried out on “Corus”. One test result is negative, but nine tests find evidence for the side effect. Each test result is sent to all doctors of the hospital in a separate e-mail (see Figure 2).

Table

Description automatically generated

**Fig 2.**The e-mails 1-10 each contain the result of one of the ten conducted tests.

Dr Smith looks into Email 1 and checks the test result. The test result in this e-mail is negative, showing no evidence for the side effect with blood type ‘B-negative’.   
  
Dr Smith does not look into the other nine e-mails.  
  
As a result, Dr Smith does not know that “Corus” causes mild leg cramps in patients with blood type ‘B-negative’.

**Garden**

**Many Epistemic Actions**

Alex is a gardener in a local botanical garden and takes care of a very delicate type of rose, the Bourbon rose. Alex regularly fertilizes the roses with the fertilizer “Flora” in order to keep them healthy and alive. The botanical garden supplies all gardeners who work in the botanical garden with gardening tools, chemicals and fertilizer. Normally, fertilizers do not harm delicate roses.

The garden manager has recently started to order an additional fertilizer, “Splendor”, that is cheaper than “Flora”. “Splendor” is as effective as “Flora”, but also has a negative effect. It harms delicate rose types such as the Bourbon rose.

However, the fact that “Splendor” harms Bourbon roses is still unknown. A standard procedure for botanical gardens is to let a specialised lab carry out a few tests on a new fertilizer. Only a specialised lab can carry out the test that tests for a fertilizer’s harmful effects.

This test for harmful effects is very insensitive. Statistically, only 1 out of 10 tests detects “Splendor”’s harmful effect on Bourbon roses. How sensitive the test is is known to all gardeners.

Ten of these tests have been carried out on “Splendor”. Nine test results are negative, but one test finds evidence for the harmful effect. Each test result is sent to all gardeners in a separate e-mail (see Figure 1).   
  
Table

Description automatically generated

**Fig 1.**The e-mails 1-10 each contain the result of one of the ten conducted tests.

Alex looks into Email 1 and checks the test result. The test result in this e-mail is negative, showing no evidence for a harmful effect on Bourbon roses.  
  
Alex does not look into the other nine e-mails.

As a result, Alex does not know that "Splendor" harms the Bourbon rose.

**Few Epistemic Actions**

Bob is a gardener in a local botanical garden and takes care of a very delicate type of rose, the China rose. Bob regularly fertilizes the roses with the fertilizer “Vitax” in order to keep them healthy and alive. The botanical garden supplies all gardeners who work in the botanical garden with gardening tools, chemicals and fertilizer. Normally, fertilizers do not harm delicate roses.

The garden manager has recently started to order an additional fertilizer, “Nutrit”, that is cheaper than “Vitax”. “Nutrit” is as effective as “Vitax”, but also has a negative effect. It harms delicate rose types such as the China rose.

However, the fact that “Nutrit” harms China roses is still unknown. A standard procedure for botanical gardens is to let a specialised lab carry out a few tests on a new fertilizer. Only a specialised lab can carry out the test that tests for a fertilizer’s harmful effects.

This test for harmful effects is very sensitive. Statistically, 9 out of 10 tests detect “Nutrit”’s harmful effect on China roses. How sensitive the test is is known to all gardeners.

Ten of these tests have been carried out on “Nutrit”. One test result is negative, but nine tests find evidence for the harmful effect. Each test result is sent to all gardeners in a separate e-mail (see Figure 2).

Table

Description automatically generated

**Fig 2.**The e-mails 1-10 each contain the result of one of the ten conducted tests.

Bob looks into Email 1 and checks the test result. The test result in this e-mail is negative, showing no evidence for a harmful effect on China roses.  
  
Bob does not look into the other nine e-mails.

As a result, Bob does not know that "Nutrit" harms the China rose.

**Bakery**

**Many Epistemic Actions**

Sandra is a baker who works for the local bakery in town. The bakery offers a variety of pastries, including nut allergy friendly cakes, muffins and cookies. Sandra uses flour of the brand “White Mill” when baking. The bakery provides all necessary baking products including flour. Normally, flour does not contain traces of nuts.

The bakery manager has recently started to order an additional flour brand, “Harvest”, that is cheaper than “White Mill”. “Harvest” is of the same quality as “White Mill”, but differs in one aspect. It contains traces of walnuts.

However, the fact that “Harvest” contains traces of walnuts is still unknown. A standard procedure for bakeries is to let a specialised lab carry out a few tests on a new flour brand. Only a specialised lab can carry out the test that tests for traces of nuts.

This test for traces of nuts is very insensitive. Statistically, only 1 out of 10 tests detect traces of nuts. How sensitive the test is is known to all bakers.

Ten of these tests have been carried out on “Harvest”. Nine test result are negative, but one test finds evidence for traces of walnuts. Each test result is sent to all bakers in a separate e-mail (see Figure 1).

Table

Description automatically generated

**Fig 1.**The e-mails 1-10 each contain the result of one of the ten conducted tests.

Sandra looks into e-mail 1 and checks the test result. The test result in this e-mail is negative, showing no evidence for traces of nuts.

Sandra does not look into the other nine e-mails.

As a result, Sandra does not know that "Harvest" contains traces of walnuts.

**Few Epistemic Actions**

Please imagine the following scenario:

(Part 1)

Anne is a baker who works for the local bakery in town. The bakery offers a variety of pastries, including nut allergy friendly cakes, muffins and cookies. Anne uses flour of the brand “Green Farms” when baking. The bakery provides all necessary baking products including flour. Normally, flour does not contain traces of nuts.  
  
The bakery manager has recently started to order an additional flour brand, “Homestead”, that is cheaper than “Green Farms”. “Homestead” is of the same quality as “Green Farms”, but differs in one aspect. It contains traces of hazelnuts.

However, the fact that “Homestead” contains traces of hazelnuts is still unknown. A standard procedure for botanical gardens is to let a specialised lab carry out a few tests on a new flour brand. Only a specialised lab can carry out the test that tests for traces of nuts.

This test for traces of nuts is very sensitive. Statistically, 9 out of 10 tests detect traces of nuts. How sensitive the test is is known to all bakers.

Ten of these tests have been carried out on “Homestead”. One test result is negative, but nine tests find evidence for traces of hazelnuts. Each test result is sent to all bakers in a separate e-mail (see Figure 2).

Diagram, calendar

Description automatically generated with medium confidence

**Fig 2.**The e-mails 1-10 each contain the result of one of the ten conducted tests.

Anne looks into e-mail 1 and checks the test result. The test result in this e-mail is negative, showing no evidence for traces of nuts.  
  
Anne does not look into the other nine e-mails.

As a result, Anne does not know that "Homestead" contains traces of hazelnuts.