



Knowledge brief

Pandemic Preparedness & Behaviour: Zoonoses – Survey monitor results September 2025

Summary

Background

Zoonoses are infectious diseases that can be transmitted from animals to humans. There are various ways in which infection can occur, including through contact with animals or animal products, by touching dead wild animals, or through contact with contaminated surface water. Some zoonoses, such as COVID-19, can be transmitted between humans. The transmission of infectious diseases from animals to humans can sometimes be prevented through preventive behaviour, such as handwashing after touching an animal or avoiding contact with dead wild animals. As part of the Pandemic Preparedness & Behaviour programme, the National Institute for Public Health and the Environment (RIVM) has investigated the extent to which people in the Netherlands engage in a selection of these preventive behaviours, and the factors that influence this.

Objective

The study answers the following questions:

1. What do people in the Netherlands know about zoonoses?
2. How do people view the recommendations for preventive behaviour?
3. To what extent do people follow the behavioural recommendations?
4. What demographic and psychosocial factors are associated with adherence to the behavioural recommendations?
5. What are the differences in terms of knowledge and compliance with these behavioural recommendations between the Netherlands and other countries in Europe (Slovenia and Ireland)?

The results can be used to inform policy, practical interventions and communication strategies aimed at preventing zoonoses.

Research method

For this study, a number of questions were added to Round 4 of the ongoing Pandemic Preparedness & Behaviour survey monitor. The survey was conducted in September 2025 among a representative sample of 2,761 respondents.

Key results

- Knowledge and perceptions:
 - o Most participants (over 8 in 10) correctly stated that people can get sick from direct contact with animals or animal products, or from swimming in open water. Fewer people were aware of infection pathways not involving direct contact, such as visiting a petting zoo without touching the animals (5 in 10) or swimming in open water without ingesting water (6 in 10).
- Compliance with behavioural recommendations:
 - o The recommendation that people should wash their hands after walking or touching pets is followed less consistently than hygiene recommendations relating to other animals and animal products

RIVM

National Institute for Public Health and the Environment

A. van Leeuwenhoeklaan 9
3721 MA Bilthoven
PO Box 1
3720 BA Bilthoven
www.rivm.nl/en

T 088 689 89 89

Authors:

Mart van Dijk, Roos Dekker,
Jet Sanders, Floor Kroese

Centre:

PLG

Contact person:

colene.zomer@rivm.nl

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- o Most respondents who had encountered a dead wild animal said they had not touched it. Respondents who had touched a dead wild animal mostly followed the behavioural recommendation to wash their hands afterwards.
- o Fewer than a quarter of respondents had checked the water quality the last time they went swimming. One in three felt that this recommendation is difficult to follow. Half of the respondents who had swum in open water said that they had washed their hands before eating afterwards.
- o Parents reported that their children seemed to follow the handwashing recommendations less consistently than adults did.
- Comparison with other countries:
 - o In the Dutch survey, half of the respondents said that they washed their hands after touching a pet, compared to 6 in 10 in Ireland and 8 in 10 in Slovenia.
 - o The Dutch respondents generally felt that it was easier to comply with the behavioural recommendations.
 - o Respondents in Slovenia and Ireland believed more strongly in the effectiveness of handwashing and were more likely to think that others would wash their hands after animal contact.

Opportunities for policy, practice and communication:

- **Awareness of potential pathways of infection from animals to humans could be improved through targeted education** (aimed at relevant target groups, through appropriate channels, in areas where infection rates are higher). Such educational initiatives should not only explain the risks associated with certain behaviours, but also why these behaviours are risky and how transmission occurs. This contributes to the perceived effectiveness of proposed preventive behavioural recommendations.
- Three-quarters of respondents who had swum in open water had not checked the water quality before their most recent swim. Public communication could **explain where people can go to check the water quality, the extent to which quality levels can vary over time in different locations, and how often information is updated**. When unsafe water warnings are issued, they should be accompanied by an explanation of the associated risks as well as advice for people who want to enter the water regardless.
- If contact with pets is considered risky, it is important to **make it clear in which situations vigilance and extra hygiene precautions are necessary**. It is unrealistic to expect people to wash their hands every time they touch their pet.
- Young children can be more likely to contract infections. **Hygienic behaviour in children can be promoted by providing parents and caregivers with tools to help establish routines and encourage the desired behaviour**. This can be achieved, for instance, by establishing good habits: 'when I come home, I hang up my coat and wash my hands'. Water and soap should be within easy reach.

Background

Zoonoses are infectious diseases that can be transmitted from animals to humans. There are various ways in which infection can occur, including through contact with animals or animal products, by touching dead wild animals, or through contact with contaminated surface water. Well-known examples include rabies, which can be transmitted by a scratch or bite from an infected animal, and Weil's disease, which can be contracted by swimming in open water contaminated with rat urine. COVID-19 is another well-known zoonosis.

In this study, we focused on zoonoses that:

- a) Can be prevented through preventive behaviours
- b) Are relevant to the general population (as opposed to those that are mainly relevant in professional contexts, such as on chicken farms)
- c) Can also be transmitted between humans

An earlier knowledge brief, entitled [Preventive behaviour to avoid animal-transmitted diseases](#), set out what is known in the behavioural science literature about compliance with preventive behaviours in the context of zoonotic diseases. This literature review found that people are more likely to engage in preventive behaviour if they have a better understanding of zoonoses. Those who are convinced that specific preventive behaviours are effective at preventing infections (response effectiveness) and that these behaviours are easy to implement (self-efficacy) also tend to be more likely to engage in them.

This knowledge, along with input from various experts in the fields of medical epidemiology and behavioural science, was used to design the survey for the current study.

The study answers the following questions:

1. What do people in the Netherlands know about zoonoses?
2. How do people view the recommendations for preventive behaviour?
3. To what extent do people follow the behavioural recommendations?
4. What demographic and psychosocial factors are associated with adherence to the behavioural recommendations?
5. What are the differences in terms of knowledge and compliance with these behavioural recommendations between the Netherlands and other countries in Europe (Slovenia and Ireland)?

Research method

As part of the Pandemic Preparedness & Behaviour monitor, we added a number of questions related to zoonoses to the survey. The survey was conducted in September 2025 among Centerdata's LISS panel (Tilburg University) and completed by 2,761 respondents (see Table 1).

The survey¹ included questions designed to gauge respondents' knowledge of animal-to-human disease transmission, their risk perception, and their adherence to behavioural recommendations. For each recommendation, respondents were asked whether they believed it was effective at preventing the spread of infections (response effectiveness), whether they found it easy to follow (self-efficacy), and to what extent they thought important people in their lives followed it (social norm).

¹ The full survey is available at <https://data.rivm.nl/meta/srv/dut/catalog.search#/metadata/f56b66b4-d7e9-4665-aa31-8a165d2a53fe>.

The monitor was developed by RIVM in collaboration with international partners in Slovenia, Ireland and Spain. The European Commission and WHO Europe were involved as well. Round 4 of the survey was also conducted in Slovenia and Ireland in September 2025.

Table 1: Characteristics of respondents (n = 2,761)*

		n	%
<i>Gender</i>	Women	1,434	51.9%
	Men	1,324	48.0%
	Other	3	0.1%
<i>Education</i>	Primary education/pre-vocational secondary education	655	23.8%
	Senior general secondary education/pre-university education/senior secondary vocational education	1,087	39.5%
	Higher professional education/university education	1,012	36.7%
<i>Age</i>	< 25	227	8.2%
	25-39	453	16.4%
	40-54	529	19.2%
	55-69	790	28.6%
	70+	762	27.6%
<i>Degree of urbanisation</i>	Rural	931	33.9%
	Suburban	956	34.8%
	Urban	860	31.3%
<i>Has children aged between 2 and 12</i>	Yes**	325	11.8%

* Weighting was used to ensure that the characteristics of the sample aligned with those of the general Dutch population in terms of gender, education and age.

** Average age of youngest child = 6.6 years, standard deviation = 3.2.

Analysis

For the first three research questions – what do people know about zoonoses, how do people view the behavioural recommendations, and to what extent do they follow them – we report descriptive results.

For the fourth research question – what factors are associated with adherence to the behavioural recommendations – we conducted random forest analyses. A random forest analysis is a method that automatically identifies patterns in data and shows which factors are most important for predicting a particular outcome. In this analysis, we included demographic factors (gender, age, education, urbanisation) and psychosocial factors (self-efficacy, response effectiveness, social norm, knowledge and risk perception).

For the final research question – what are the differences between the Netherlands and other countries in Europe – we compared descriptive results for the Netherlands, Slovenia and Ireland.

Results

1. What do people in the Netherlands know about zoonoses?

Knowledge of potential infection pathways

Respondents were presented with a number of statements about situations or behaviours that may or may not lead to disease transmission. For each of these statements, they were asked to indicate whether they believed it was true or false, or whether they were unsure. The green cells in Table 2 show how many participants answered the statements correctly. Nine in 10 participants were aware of the risk of infection through raw meat. The possibility of infection through open water was mainly recognised in relation to water contaminated with the faeces of infected animals (86% were aware of this) and swimming with open wounds (81%). A smaller proportion of respondents (63%) knew that it is possible to become ill from swimming in open water without ingesting water. The statement with the lowest number of correct responses concerned the risk of getting sick by visiting a petting zoo without touching the animals (50%). Respondents were relatively more likely to say they were not sure if this statement was true.

Table 2: Respondents' knowledge of pathways of infection from animals to humans (correct responses shown in green*).

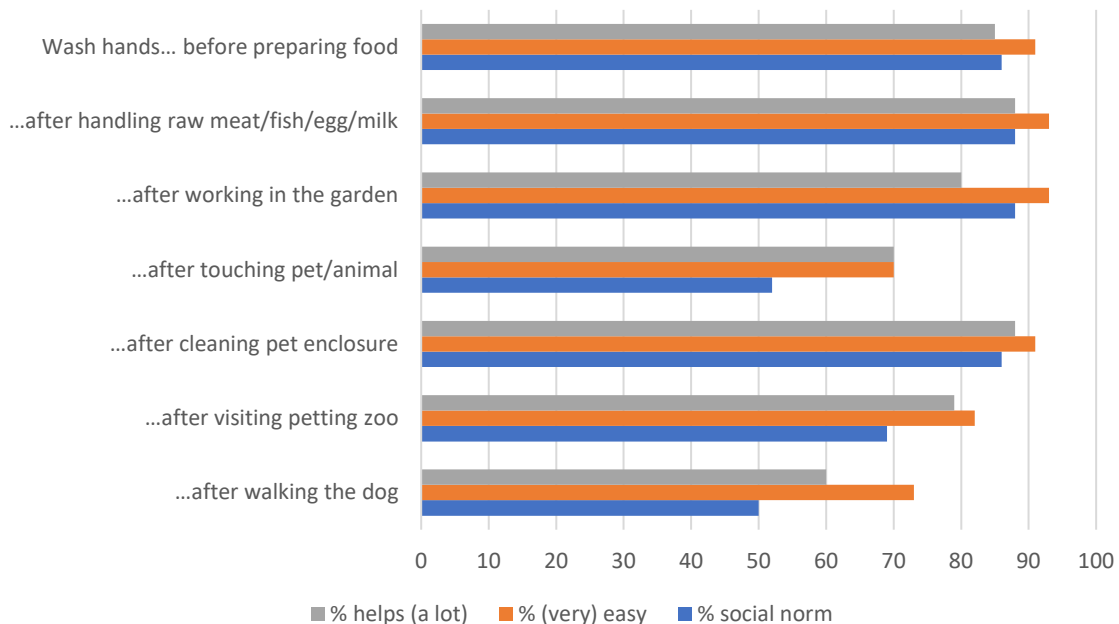
Statements	True	False	Not sure
1. You can get sick if you eat from a plate or cutting board that has had raw meat on it	90%*	3%	7%
2. You can only get sick from swimming in open water if you ingest the water	23%	63%*	14%
3. Some diseases can be transmitted through contact with a pet's saliva	76%*	4%	20%
4. Only visibly sick animals can make you sick	5%	83%*	12%
5. You can get sick from eating raw or undercooked meat	92%*	4%	4%
6. If you swim in open water when you have a small wound, you're at a higher risk of getting sick	81%*	5%	14%
7. You can get sick from visiting a farm or petting zoo, even if you don't touch the animals	50%*	19%	31%
8. Some diseases can be transmitted through water contaminated with faeces from infected animals	86%*	3%	11%

2. How do people view the recommendations for preventive behaviour?

Respondents were asked how they viewed specific hygiene recommendations relating to contact with animals and animal products, contact with dead wild animals, and swimming in open water. For each recommendation, respondents were asked whether they believed it was effective at preventing the spread of infections (response effectiveness), whether they found it easy to follow (self-efficacy), and to what extent they thought important people in their lives followed it (social norm). These factors are often correlated with behaviour.

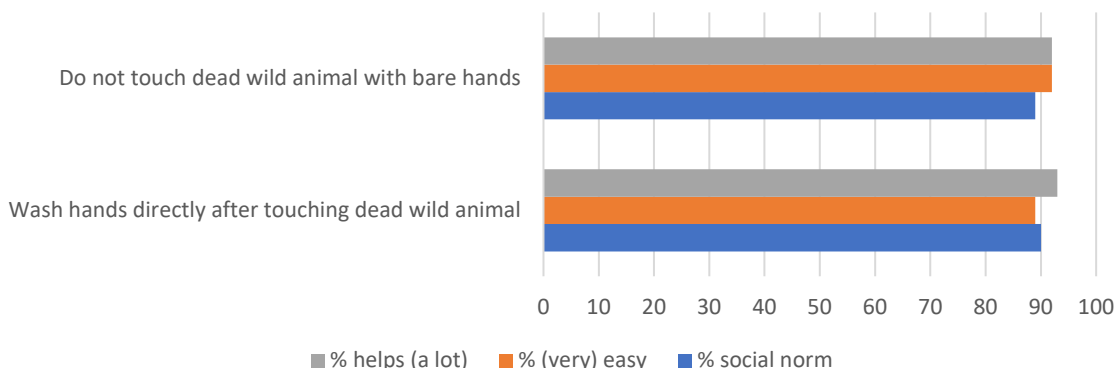
Figure 1a shows that most respondents (more than 8 out of 10) believed that the hygiene recommendations regarding contact with animals and animal products were effective and easy to implement. Most participants (more than 7 out of 10) also believe that other people follow the hygiene recommendations. Scores for handwashing after touching pets or other animals or walking the dog were slightly lower. Six in 10 respondents believed that handwashing after walking the dog helps to prevent the spread of infections. Half of those surveyed believed that other people followed this recommendation.

Figure 1a: Perceptions of hygiene recommendations regarding contact with animals and animal products in preventing the spread of disease.



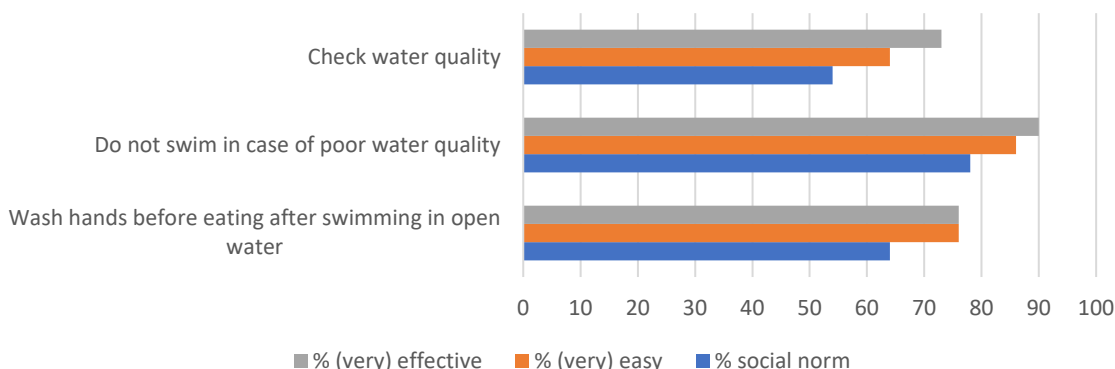
Nine in 10 respondents believed that the recommendations regarding contact with dead wild animals were effective and easy to follow, and that they were followed by others (Figure 1b).

Figure 1b: Perceptions of recommendations regarding contact with dead wild animals in preventing the spread of disease.



The recommendations for swimming in open water are as follows: check the water quality, do not go swimming if the water quality is poor, and wash your hands before eating anything after swimming. Again, a large majority (more than 7 in 10) of respondents believed the recommendations to be effective. The recommendation to check the water quality before swimming had the lowest scores. Six in 10 participants found this easy to do, and 5 in 10 believed that others followed this recommendation (see Figure 1c).

Figure 1c: Perceptions of recommendations regarding swimming in open water.

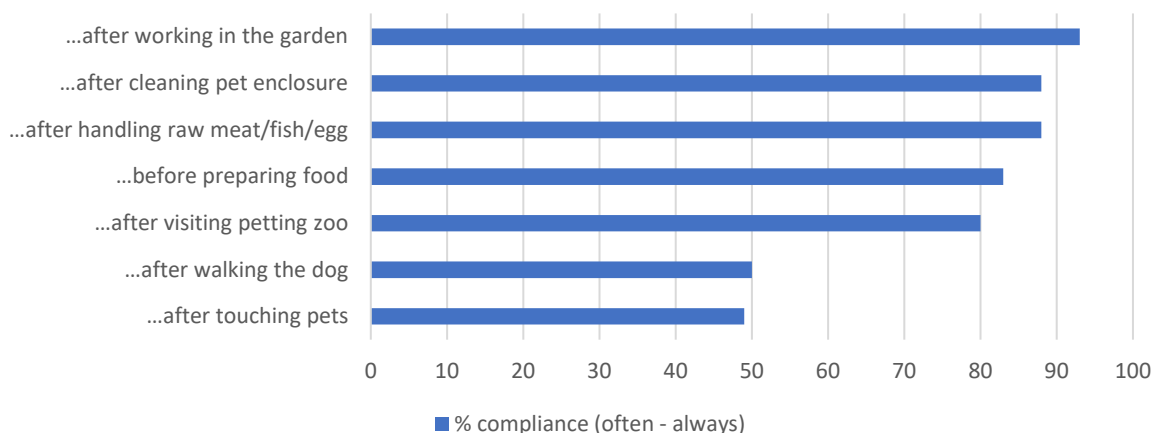


3. To what extent do people follow the behavioural recommendations aimed at preventing zoonoses?

Hygiene recommendations regarding contact with animals and animal products

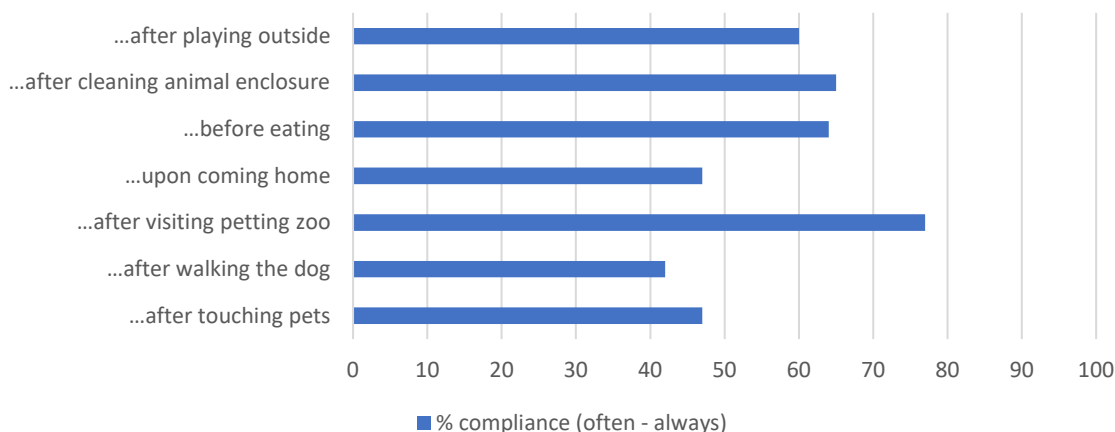
Figure 2a shows the percentage of respondents who reported washing their hands often or always in various situations. Most people often or always wash their hands after working in the garden (9 in 10), after handling raw meat, fish, eggs or milk while cooking (9 in 10), and after cleaning a pet’s kennel, cage, cat box, terrarium or aquarium (9 in 10). Around half of the respondents said they washed their hands after cuddling, petting or otherwise touching an animal (including pets), and after walking the dog.

Figure 2a: Percentage of respondents who often or always wash their hands in specific situations.



Respondents with children aged between 2 and 12 ($n = 325$) were asked how often their children washed their hands in various situations (see Figure 2b). Handwashing occurred most frequently after visiting a stable or petting zoo (8 in 10) and least frequently after walking the dog (4 in 10), upon coming home (5 in 10), and after cuddling, petting or otherwise touching an animal (including pets) (5 in 10). Although not all situations were directly comparable with those reported on by the adult respondents themselves, compliance with hygiene recommendations seems to be lower among children. This is evident, for example, when it comes to handwashing after cleaning a pet enclosure (88% of respondents said they washed their hands often or always; 65% said their children washed their hands) or after walking the dog (50% vs 42%). Parents may also not always know when their children wash their hands.

Figure 2b: Percentage of respondents who said their children often or always wash their hands in specific situations (if applicable).



Contact with dead wild animals

Respondents were asked if they had seen a dead wild animal in the past year and, if so, if they had touched it and how they had done so. Around 46% said they had seen a dead wild animal in the past year, but most (87%) had not touched it. Respondents who had touched a dead wild animal did so with a disposable or other type of plastic glove (5%), with a stick or other object (5%) or directly with their bare hands (3%).

It is recommended that people wash their hands with soap and water immediately after touching a dead wild animal. Of the respondents who had touched a dead wild animal, around half washed their hands immediately afterwards (before touching anything else), while around a third washed their hands when they got home. One in 10 respondents reported using disinfectant hand gel or spray after touching a dead wild animal. A small group neither washed their hands nor used disinfectant hand gel or spray (around 1 in 10).

Swimming in open water

Respondents were asked how often they had swum in open water over the previous three months. 'Open water' was defined as including inland bodies of water, such as rivers, canals, ponds and lakes, but not the sea. Around one-fifth (21%) said they had swum in open water over the previous three months.

Of the respondents who had swum in open water, 23% had looked up whether the water quality of the body of water was monitored prior to their last swim; 92% of this group reported that the water quality had been suitable for swimming. Roughly 23% of respondents said they had ingested water during their most recent swim.

It is recommended that people wash their hands before eating anything after swimming in open water. Around half of the respondents said they had followed this recommendation the last time they went swimming.

4. What demographic and psychosocial factors are associated with adherence to the behavioural recommendations?

We examined which factors are associated with behaviour for five behavioural recommendations: two universal recommendations about handwashing before and after preparing food, one recommendation about handwashing (or using hand gel²) after touching a dead wild animal, and two recommendations about swimming in open water (checking water quality and washing hands afterwards).

For four of these behavioural recommendations (washing hands before preparing food, washing hands after handling meat, fish or eggs while cooking, washing hands before eating after swimming in open water, and checking water quality before swimming), the three most significant predictors of behaviour were the same: the belief that it is easy to perform the behaviour (self-efficacy), the belief that the behaviour helps prevent the spread of infections (response effectiveness), and the belief that others also perform this behaviour (social norm).

For washing hands or using hand gel after touching a dead wild animal, risk perception was the most important predictor: respondents who considered it more likely that an

² In the Netherlands, it is recommended that people wash their hands with soap and water after touching a dead wild animal. For the purposes of this study, the use of disinfectant hand gel was also viewed as complying with this recommendation, as it is a reasonable alternative when soap and water are unavailable.

infectious disease outbreak would occur in the next five years were more likely to wash their hands or use hand gel after touching a dead wild animal.

Demographic factors did not play a significant role in predicting adherence to the behavioural recommendations.

5. What are the differences in terms of knowledge and compliance with these behavioural recommendations between the Netherlands and other countries in Europe?

The questions in this monitor were also surveyed in Slovenia and Ireland, as collecting data in multiple countries allows us to put the Dutch findings in context. Several notable differences emerged:

Awareness

Compared to Slovenia (SI) and Ireland (IE), people in the Netherlands were more aware that you can get sick from ingesting water while swimming in open water (NL: 8 in 10; SI: 6 in 10; IE: 7 in 10). In Slovenia, people were more aware that you can get sick from visiting a petting zoo without touching the animals (NL: 5 in 10; SI: 9 in 10, IE: 5 in 10).

Compliance with behavioural recommendations

In the Netherlands, people were less likely to wash their hands after touching a pet than in Slovenia and Ireland (NL: 5 in 10; SI: 8 in 10; IE: 6 in 10).

Four in 10 respondents in the Netherlands and Slovenia said they had seen a dead wild animal in the past year, compared to 6 in 10 Irish respondents. In the Netherlands, people who came into contact with a dead wild animal were more likely to touch it with their bare hands (3 in 10) than in Slovenia (1 in 10) and Ireland (1 in 10). Respondents in the Netherlands were also more likely to not wash their hands afterwards (NL: 1 in 10; SI: 1 in 50; IE: 1 in 50).

In Slovenia and Ireland, swimming in open water was more common than in the Netherlands (NL: 2 in 10; SI: 4 in 10; IE: 3 in 10 in the past three months). Compliance with behavioural recommendations was similar across all three countries.

Factors affecting behaviour

The belief that handwashing is effective in preventing zoonoses (response effectiveness) was generally stronger in Slovenia and Ireland than in the Netherlands. Handwashing after walking the dog in particular was viewed as fairly ineffective more often in the Netherlands (4 in 10) than in Slovenia (2 in 10) and Ireland (3 in 10). Respondents in the Netherlands found it slightly easier to comply with most recommendations than those in Slovenia and Ireland (self-efficacy). This may be related to the availability of sanitary facilities, such as water taps. In Slovenia and Ireland, there are stronger social norms around handwashing after contact with pets (i.e. after walking or touching a pet) than in the Netherlands (NL: 5 in 10; SI: 7 in 10; IE: 7 in 10). In the Netherlands, on the other hand, there is a stronger social norm around not swimming in open water when the water quality is poor (NL: 8 in 10; SI: 6 in 10; IE: 7 in 10).

Policy implications

This study has provided insight into people's knowledge of, perceptions of, and behaviour towards preventive actions that can reduce the risk of zoonoses. Below, we discuss how these results can be used to promote preventive behaviour through policy. We also identify several avenues for further research.

Promoting preventive behaviour through policy

The results have highlighted several areas of interest when it comes to promoting preventive behaviour. Policy and communication could play a role here, for example with regard to the following points:

- *Raising awareness of zoonoses.* Many people are not aware of the fact that diseases can be transmitted from animals to humans even without direct contact. Awareness of possible pathways of infection from animals to humans could be improved through targeted education (aimed at relevant target groups, through appropriate channels, in areas where infection rates are higher). Such educational initiatives should not only explain the risks associated with certain behaviours, but also why these behaviours are risky and how transmission occurs. This contributes to the perceived effectiveness of proposed preventive behavioural recommendations.
- *Supporting decision-making around swimming in open water.* Three-quarters of respondents who had swum in open water had not checked the water quality before their most recent swim. Public communication could explain where people can go to check the water quality, the extent to which quality levels can vary in different locations, and how often information is updated. When unsafe water warnings are issued, they should be accompanied by an explanation of the associated risks as well as advice for people who want to enter the water regardless.
- *Providing information about contact with pets.* Half of the respondents often or always washed hands after walking or touching their pets. If contact with pets is considered risky, it is important to make it clear in which situations vigilance and extra hygiene precautions are necessary. It is unrealistic to expect people to wash their hands every time they touch their pet.
- *Promoting good habits in children.* Young children can be more likely to contract infections. Hygienic behaviour in children can be promoted by providing parents and caregivers with tools to help establish routines and encourage the desired behaviour. This can be achieved, for instance, by establishing good habits: 'when I come home, I hang up my coat and wash my hands'. Water and soap should be within easy reach.

The options for preventive measures vary depending on the behaviour and context. For instance, there are usually no water taps in areas where people may encounter a dead wild animal or swim in natural bodies of water. Recommendations should be feasible and appropriate for real-life situations, so in this example it is important to consider what people can do when washing their hands is not an option (bring and use hand gel, not touch food/drink with their hands but eat directly from the package or with cutlery). The options for measures aimed at promoting preventive behaviour in new or rare situations are also different from those targeted at encouraging healthy habitual behaviour at home. The most effective interventions for each behaviour, context and target group can be identified through a behavioural science analysis.

Avenues for further research

This knowledge brief is based on a one-off measurement taken as part of a survey monitor of the general population. The results can be used to identify several areas of interest when it comes to promoting preventive behaviour (see above). Further knowledge gathering is also relevant to prevent zoonoses. Follow-up research could be aimed at:

- *Gaining insight into other high-risk behaviours that occur in more specific target groups.* The behaviours measured in this study are a selection of behaviours that

can help prevent zoonoses. Other behaviours, some of which are higher risk, are relevant as well. These include contact with bats, importing animals and professional interactions with (sick) animals. Follow-up research focusing on specific target groups, such as travellers to certain high-risk areas or people who handle animals professionally, could shed light on less common yet high-risk behaviours as well as people's awareness of these risks.

- *Deepening understanding of factors involved in performing preventive behaviour.* Besides the determinants measured in this study, there are also other factors that may play a role in performing preventive behaviour. These include access to a tap in situations where handwashing is recommended, but also people's risk perceptions and lines of reasoning in the specific situations to which the preventive behavioural recommendations apply. Additional research is needed to gain a deeper understanding of the factors involved and people's considerations around performing the behaviours. A more complete picture of how behaviour is shaped could contribute to the development of interventions that are better aligned with key determining factors.

Conclusion

This study has provided insight into people's knowledge of, perceptions of, and behaviour towards preventive actions that can reduce the risk of zoonoses. The results have highlighted several areas of interest when it comes to raising awareness and promoting

preventive behaviour. For example, part of the Dutch population is unaware that diseases can be transmitted from animals to humans without direct contact (e.g. by swimming in open water or by being in spaces where animals are present). Some people say they find it difficult to check water quality before they go swimming. Hygiene recommendations for contact with pets are followed less frequently than other recommendations regarding contact with animals. Depending on the estimated severity of specific risks, the government can deploy targeted interventions and support to promote hygienic behaviour.