



Calgary



2019 Citizen Flood Risk Research

Telephone Survey Key Findings Report

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Background, Objectives, and Methodology

Background

Since the 2013 flood, it has been a priority for The City of Calgary (The City) to build resilience to flooding. A cornerstone of resilience is citizen awareness and action. To this end, The City has been conducting an annual campaign to raise awareness of flood risk every spring.

To continue to improve the effectiveness of its citizen awareness and preparedness activities, The City is seeking to understand citizens' levels of awareness, action and knowledge gaps related to flood risk and preparedness.

The research program included 21 in-depth interviews with key stakeholders (reported on separately) and a random citizen telephone survey (this report).

The results of the research program will inform the development of future citizen education activities intended to inspire action and increase flood resilience within our communities.

Objectives

The objectives of the phone survey are to:

- Measure citizens' level of understanding of their personal risk of river flooding;
- Identify what, if any, actions citizens have taken to reduce their risk of damages and increase their safety during a flood;
- Identify perceived barriers to action among citizens who have not taken any action to reduce their flood risk;
- Understand citizens' level of knowledge about how to reduce flood risk;
- Identify citizens' information needs as they relate to understanding their risk of river flooding, actions to reduce risk and how to prepare for the potential impacts of a major flood; and
- Understand how citizens would prefer to learn about flood risk and actions they can take to reduce their risk of damages and increase their safety during a flood.

Research Methodology

- Advanis conducted a telephone survey between November 25th, 2019 and December 12th, 2019 with 803 Calgarians aged 18 years or older. Both landline and cell phone sample was used.
- Average interview length was 16.5 minutes
- The sample included 401 Calgarians inside the flood zone and 402 Calgarians outside the flood zone
- The final data was weighted to ensure the overall sample's quadrant, age, and gender composition reflects that of the actual population of Calgary.
- The margin for error for Calgarians living inside the flood zone, as well as for those outside of the flood zone, is $\pm 4.9\%$, 19 times out of 20.



Summary of Findings and Recommendations

Risk Perceptions

Although Calgarians who live inside the flood zone are significantly more concerned about flooding, are more likely to perceive to their flood risk to moderate or high, and feel a greater need to prepare for river flooding than those who live outside of the flood zone:

- About one-third (30%) of those living in the flood zone are not (very) concerned about flooding; and
- 22% perceive their flood risk to be low (15% in 1:100 flood zone and 45% in the 1:200 flood zone)

Mitigative Measures Taken and Barriers to Action

Each of the main flood preparedness measures are reported by less than half of Calgarians who live inside the flood zone, with those outside of the flood zone reporting several measures even less frequently.

- The exception is storing important items in a safe place, which two-thirds of those inside the flood zone reported doing.
- Even within the 1:100 flood zone, Calgarians could be more prepared to evacuate. Only about half have an evacuation plan and only about one-quarter have a grab-and-go evacuation kit.
- The main reason for not having flood preparedness measures in place is due to low perceived risk from flooding, especially outside of the flood zone and for more expensive measures. Additionally:
 - 38% of Calgarians inside the flood zone do not perceive a grab-and-go kit to be useful and 35% never thought of it.
 - One-quarter of Calgarians inside the flood zone haven't purchased overland flood insurance because it is not available to them or because they were denied coverage.
- Among Calgarians who currently do not have an evacuation plan, a majority would be at least somewhat likely to create one if The City provided a template.
- Just over half of Calgarians who live inside the flood zone and who currently do not have a sump pump indicate that they would be likely to install one if The City provided simple instructions. Of those not at all likely, very few would install a sump pump even if The City subsidized the cost.

The City of Calgary website is the best-known flood preparedness resource and the most preferred channel of communication for additional flood information.

- The City of Calgary is also the most trusted source of reliable information about the risks of potential river flooding and how to prepare for potential river flooding, followed closely by not-for-profit organizations.
 - Of note, citizens in the 1:100 flood zone have a substantially lower level of trust in The City, not-for-profit organizations, and the provincial government compared to those outside the 1:100 flood zone.
- Most Calgarians who lived in Calgary in 2013 could not think of any information that would have helped them before, during, or after the Flood.
- Although The City of Calgary website is the most preferred channel of communication for additional flood information, Calgarians prefer a wide range of communication channels that also include online videos or tutorials, regular mail, and email newsletters.

Social Resiliency and Mental Health Support

Calgarians report high levels of community support, both inside and outside the flood zone.

- The vast majority of Calgarians have people to support them in case of an emergency and would be willing to offer help to others.
- For those inside the flood zone, family doctors have the highest level of awareness as a mental health resource, followed by helplines and a psychologist or therapist. For those outside the flood zone, family doctors, helplines, and hospitals have similar levels of awareness.

Recommendations

1. Continue to raise awareness of potential flood risk, especially in the 1:200 flood zone, where the perceived flood risk is substantially lower compared to the 1:100 flood zone.
2. Provide templates and simple instructions to residents for developing an evacuation plan, putting together a grab-and-go kit, and installing a sump pump. Making these measures easy to implement will overcome a major barrier for many Calgarians.
3. Continue to provide information, including online videos and tutorials, on the City of Calgary website and use a wide variety of communication methods to direct people to those materials.
4. In light of high levels of community support, combined with relatively lower levels of trust in The City of Calgary, the provincial government, not-for-profits, and academic institutions in the 1:100 flood zone, engage with residents at a community-level, including working with local businesses and community organizations, to increase flood preparedness.

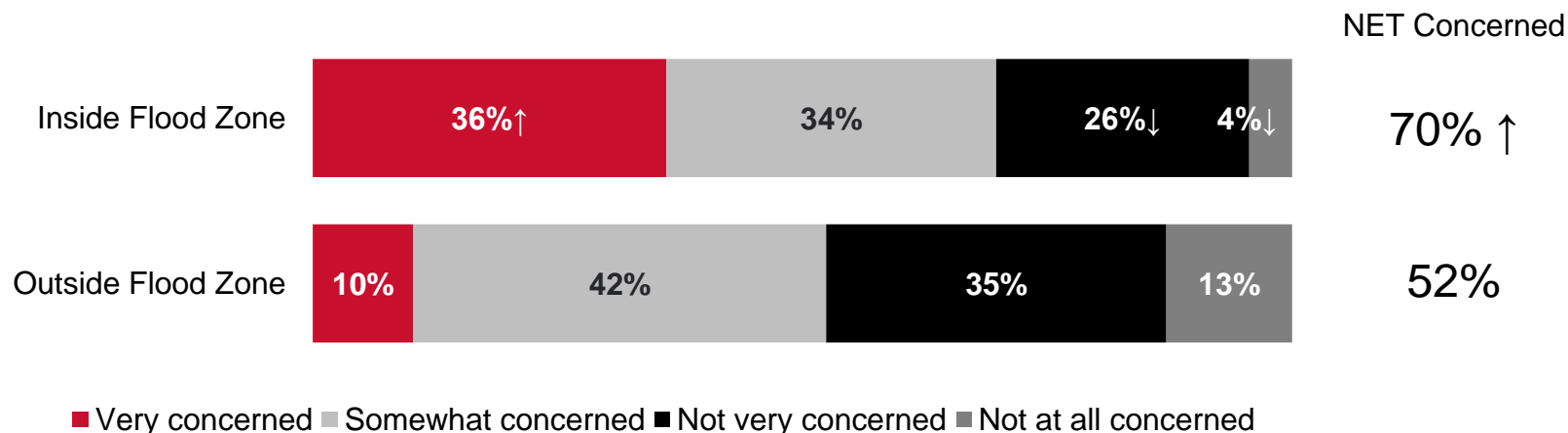


Detailed Findings: Risk Perceptions

Concern about River Flooding

Unsurprisingly, Calgarians who live inside the flood zone are significantly more concerned about flooding than those who live outside of the flood zone.

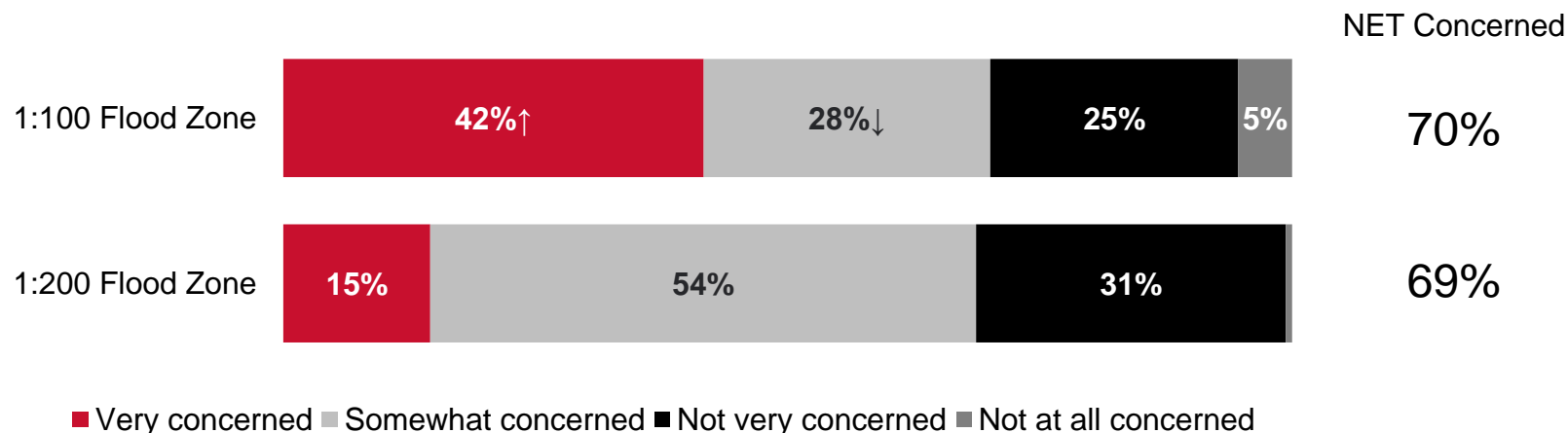
- That said, about one-third (30%) of those living in the flood zone are not (very) concerned about flooding.



Concern about River Flooding

A higher proportion of those who live in the 1:100 flood zone are *very concerned* about river flooding in Calgary.

- Though again, even among those in the 1:100 flood zone, about one-third (30%) are not (very) concerned about flooding.



Base: All respondents (excluding Don't know) (1:100 n=297; 1:200 n=101)

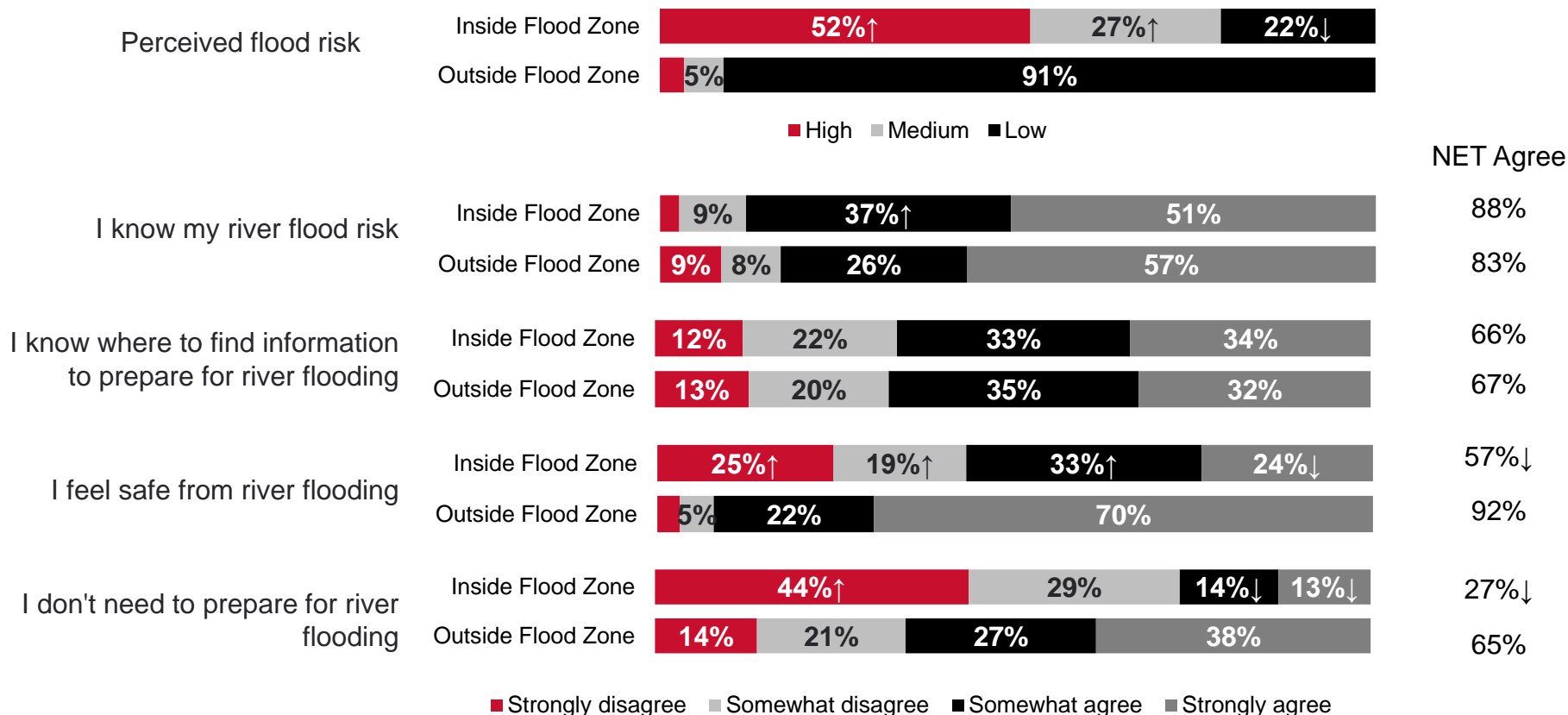
A1. Overall, how concerned are you about river flooding in Calgary? Would you say you are ...

↑ Significantly higher than 1:200

↓ Significantly lower than 1:200

Perceptions Regarding Flood Risk and Preparedness

The vast majority (91%) of those living outside of the flood zone perceive their flood risk to be low while those living inside the flood zone feel more at risk and are less likely to agree that they don't need to prepare for river flooding.



Base: All respondents (excluding None/Don't know) (Inside Flood Zone n=399; Outside Flood Zone n=401)

A2. Thinking about where you live today, would you say your risk for potential river flooding is high, medium, or low?

Base: All respondents (excluding Don't know) (Inside Flood Zone n=394-399; Outside Flood Zone n=396-401)

A3. For each of the following statements, please let me know if you strongly agree, somewhat agree, somewhat disagree, or strongly disagree.

↑ Significantly higher than Outside Flood Zone

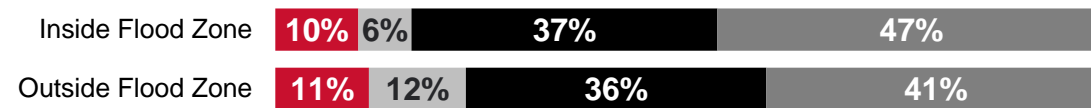
↓ Significantly lower than Outside Flood Zone

Most Calgarians, both inside and outside of the flood zone, agree that efforts to lower their risk of future flood damage are worthwhile and that they have the knowledge to do so.

Just over half would like to do more to lower their risk, though financial supports may be needed; just less than half feel they do not have the money to do so.

NET Agree

It is worth the effort to take personal action aimed at lowering my risk of future flood damage



84%

77%

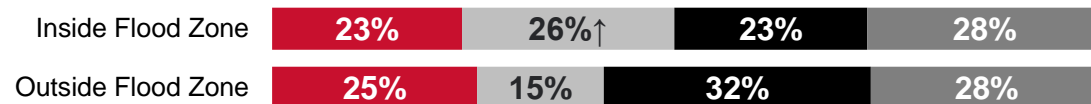
I am knowledgeable about the range of personal actions I could take in order to lower my risk of future flood damage



80%

72%

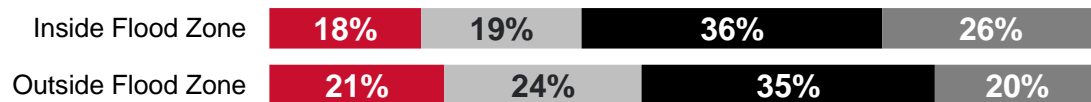
I have the money that would be required for me to take personal action to lower my risk of future flood damage



52%

60%

I would like to do more in order to lower my risk of future flood damage



62%

55%

■ Strongly disagree ■ Somewhat disagree ■ Somewhat agree ■ Strongly agree

↑ Significantly higher than Outside Flood Zone
↓ Significantly lower than Outside Flood Zone

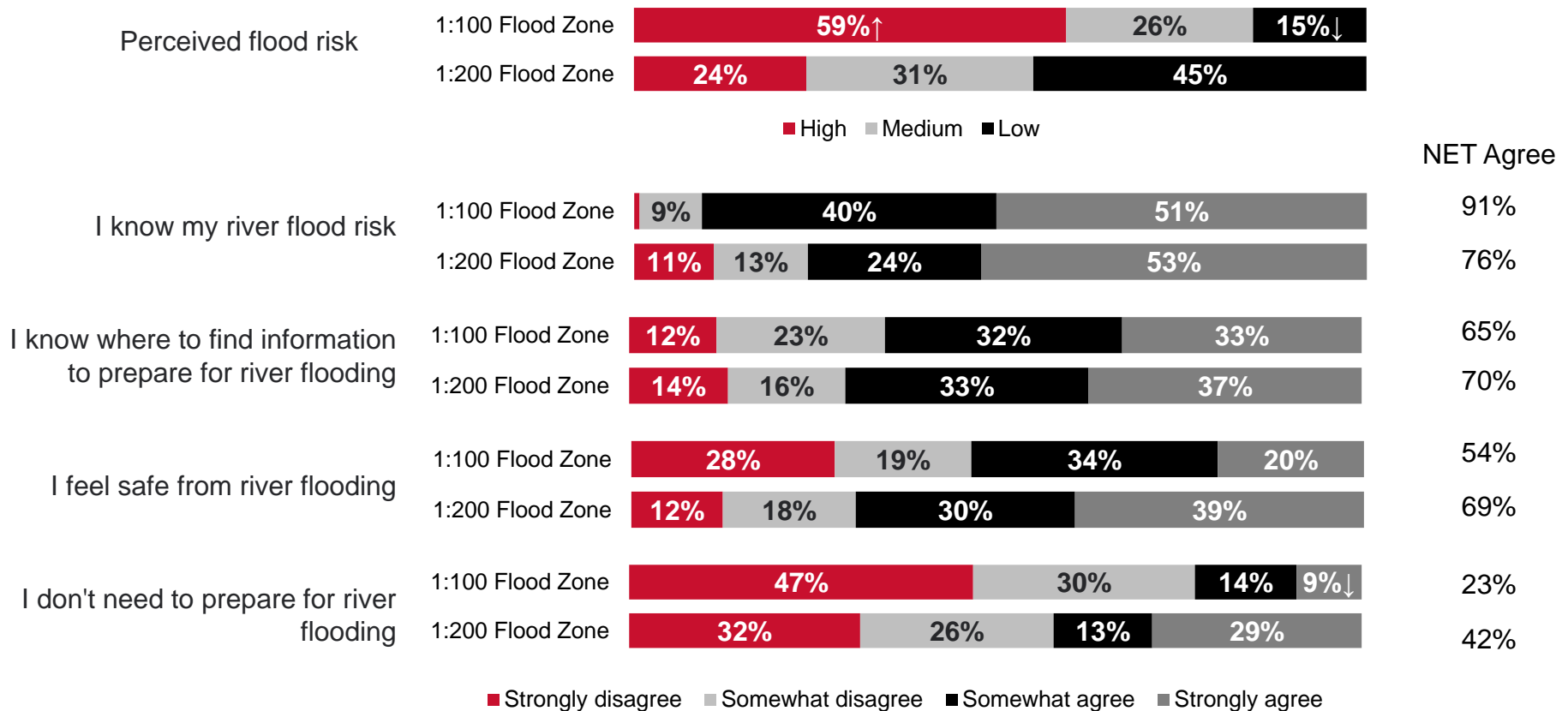
Base: All respondents (excluding Don't know) (Inside Flood Zone n=351-385; Outside Flood Zone n=377-389)

B6. For each of the following statements, please let me know if you strongly agree, somewhat agree, somewhat disagree, or strongly disagree.

Perceptions Regarding Flood Risk and Preparedness

1:100 vs. 1:200 (Inside Flood Zone)

Awareness-raising is particularly needed in the 1:200 flood zone, where the perceived flood risk is substantially lower compared to the 1:100 flood zone.



Base: All respondents (excluding None/Don't know) (1:100 n=299; 1:200 n=100)

A2. Thinking about where you live today, would you say your risk for potential river flooding is high, medium, or low?

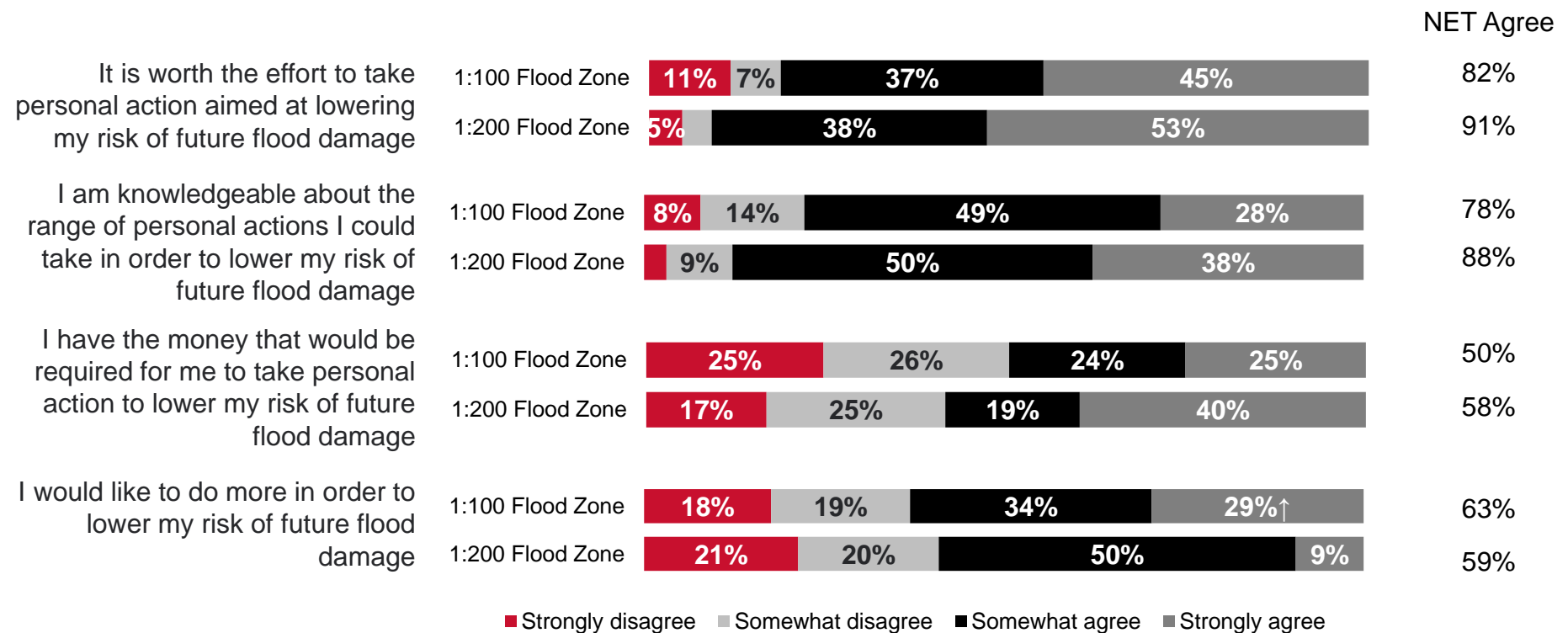
Base: All respondents (excluding Don't know) (1:100 n=296-299; 1:200 n=98-100)

A3. For each of the following statements, please let me know if you strongly agree, somewhat agree, somewhat disagree, or strongly disagree.

↑ Significantly higher than 1:200

↓ Significantly lower than 1:200

Perceptions of flood risk preparedness are very similar for those living in the 1:100 and 1:200 flood zones.



↑ Significantly higher than 1:200
 ↓ Significantly lower than 1:200

Base: All respondents (excluding Don't know) (1:100 n=259-289; 1:200 n=89-96)

B6. For each of the following statements, please let me know if you strongly agree, somewhat agree, somewhat disagree, or strongly disagree.



Detailed Findings: Mitigative Measures Taken and Barriers to Action

Flood Preparedness

With the exception of storing important items in a safe place, each of the main flood preparedness measures are reported by less than half of Calgarians who live inside the flood zone, with those outside of the flood zone reporting several measures even less frequently.

Have ... (% Yes)

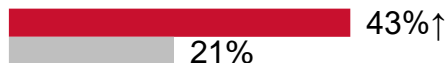
Important or sentimental items stored in waterproof bins or out of the basement



An evacuation plan



A sump pump



Overland flood insurance



Flood protection measures on your property

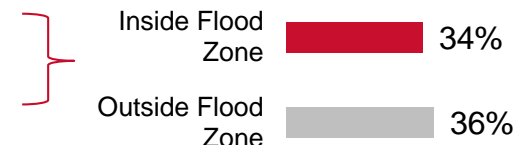


A grab-and-go evacuation kit



■ Inside Flood Zone
■ Outside Flood Zone

Have battery backup



Top 3 measures

- Modified/rebuilt house to withstand flooding: 33%
- Backflow valve/backflow preventer/one-way valve: 23%
- Drainage system installed on property: 21%

- Drainage system installed on property: 30%
- Surface grading/sloping/landscaping: 20%
- House/property is constructed above flood level: 17%

Base: All respondents (excluding Don't know/Not Applicable) (Inside Flood Zone n=307-389; Outside Flood Zone n=306-400)

B1. In preparation for river or basement flooding, do you have ...

Base: Have a sump pump (excluding Don't know) (Inside Flood Zone n=138; Outside Flood Zone n=66)

B1b. Do you have a battery backup power source for your sump pump?

B1a. What flood protection measures on your property do you have? (Inside Flood Zone n=135; Outside Flood Zone n=61)

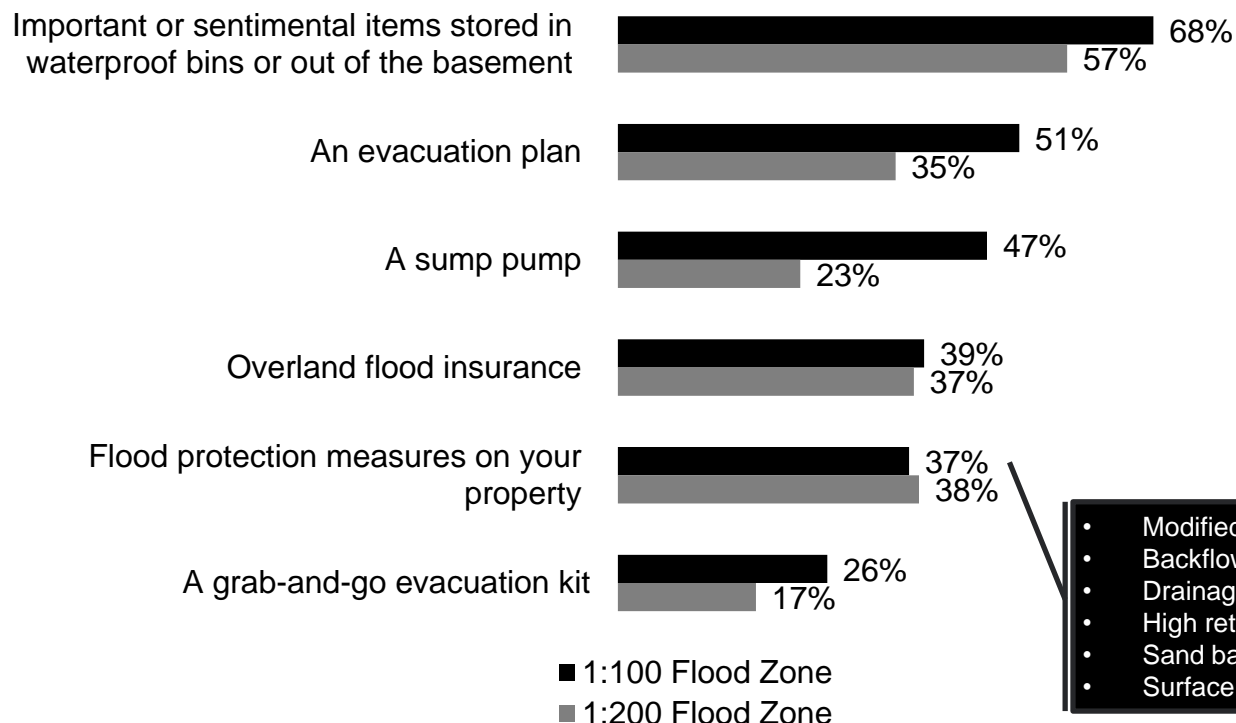
↑ Significantly higher than Outside Flood Zone

↓ Significantly lower than Outside Flood Zone

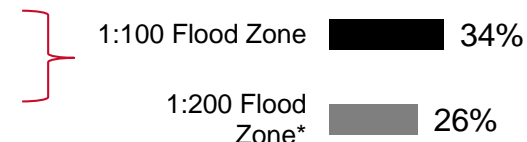
Flood Preparedness

Even within the 1:100 flood zone, Calgarians could be more prepared to evacuate. Only about half have an evacuation plan and only about one-quarter have a grab-and-go evacuation kit.

Have ... (% Yes)



Have battery backup



Top measures

- Modified/rebuilt house to withstand flooding: 33%
- Backflow valve/backflow preventer/one-way valve: 23%
- Drainage system installed on property: 21%
- High retaining wall: 13%
- Sand bags/flood sacks: 13%
- Surface grading/sloping/landscaping: 13%

Base: All respondents (excluding Don't know/Not Applicable (1:100 n=240-293; 1:200 n=67-96)

B1. In preparation for river or basement flooding, do you have ...

Base: Have a sump pump (excluding Don't know) (1:100 n=117; 1:200 n=21*)

B1b. Do you have a battery backup power source for your sump pump?

B1a. What flood protection measures on your property do you have? (Inside Flood Zone n=135)

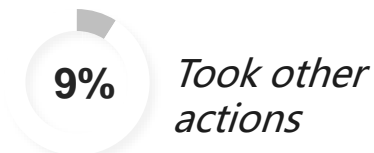
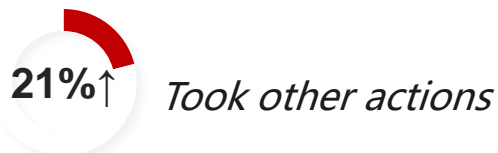
* Base <30, interpret with caution

↑ Significantly higher than 1:200

↓ Significantly lower than 1:200

Other Actions Taken to Prepare for Flooding

The most common other actions taken by those inside the flood zone are no longer storing items in the basement and having modified or renovated the basement.



Top 10 Actions Taken – Inside Flood Zone

No longer store items in basement	22%
Modified/renovated basement (e.g., changed pipes in basement, etc.)	17%
Generator	13%
Training/awareness of what to do/plan of action	12%
Free-standing pump/sump pump	12%
Backup valve/backflow preventer/one-way valve	9%
Moved to another location / planning to move	9%
Items in basement are stored in plastic tubs/raised on stilts/better organization of basement	7%
Appliances, furnace raised off the floor	6%
Attend city/community meetings about flood preparedness	4%

Top 10 Actions Taken – Outside Flood Zone

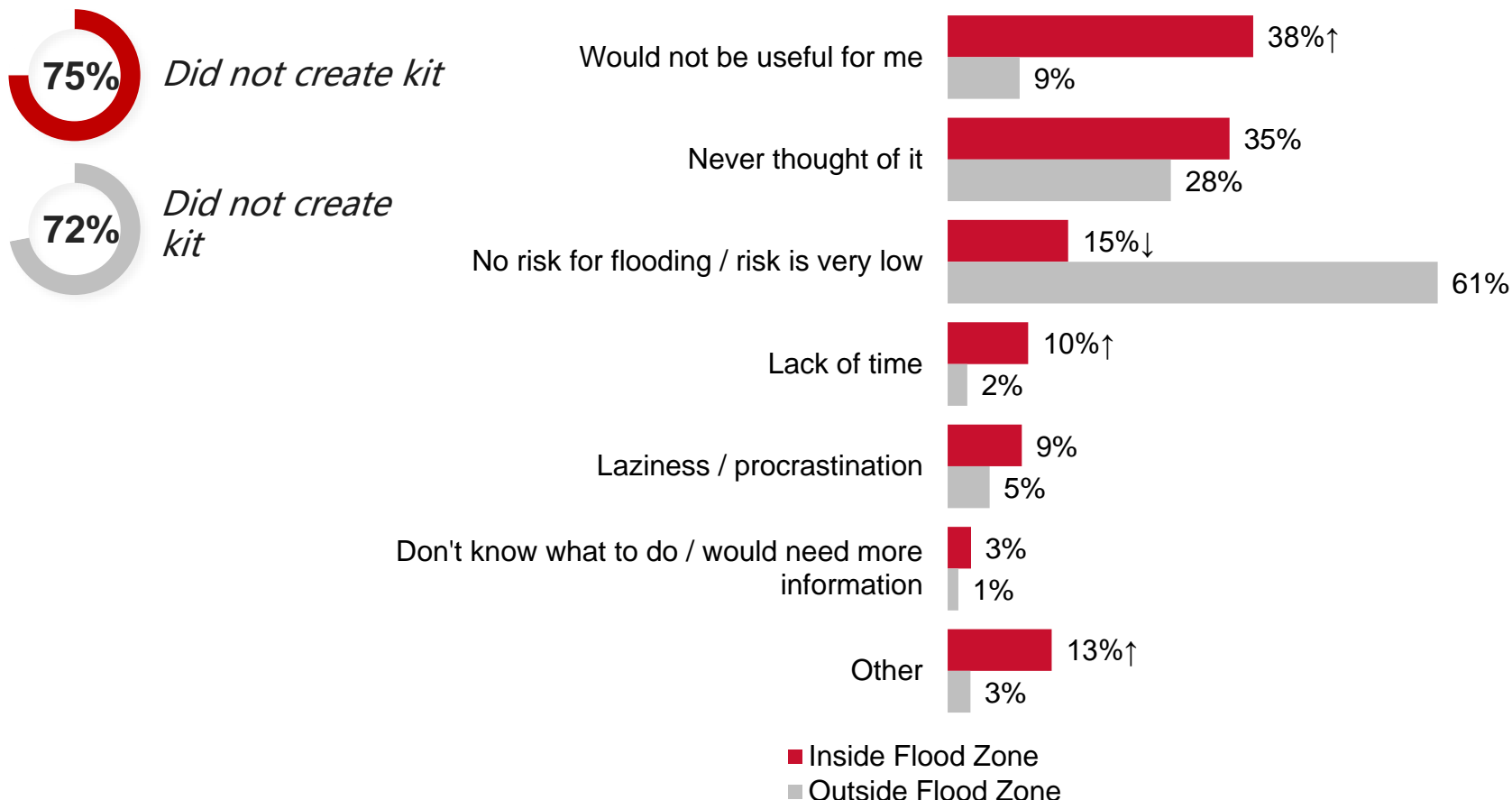
Items in basement are stored in plastic tubs/raised on stilts/better organization of basement	18%
Modified/renovated basement (e.g., changed pipes in basement, etc.)	16%
Monitors/alarms (for water leakage, presence of water in basement, etc.)	14%
Backup valve/backflow preventer/one-way valve	11%
Training/awareness of what to do/plan of action	9%
Have a boat	6%
No longer store items in basement	5%
Moved to another location / planning to move	5%
Did waterproofing outside	5%
Free-standing pump/sump pump	5%

Base: All respondents (excluding Don't know) (Inside Flood Zone n=398; Outside Flood Zone n=399)
 B2. Have you taken any other actions to prepare for potential river or basement flooding?
 Base: Took action (excluding Don't know) (Inside Flood Zone n=108; Outside Flood Zone n=40)

↑ Significantly higher than Outside Flood Zone
 ↓ Significantly lower than Outside Flood Zone

Reasons for Not Creating a Grab-and-Go Kit

Most Calgarians inside the flood zone have not created a grab-and-go kit because they don't feel it would be useful or they hadn't thought of it while most of those outside of the flood zone haven't created one because they perceive their flood risk is low.



↑ Significantly higher than Outside Flood Zone
↓ Significantly lower than Outside Flood Zone

Reasons for Not Creating a Grab-and-Go Kit

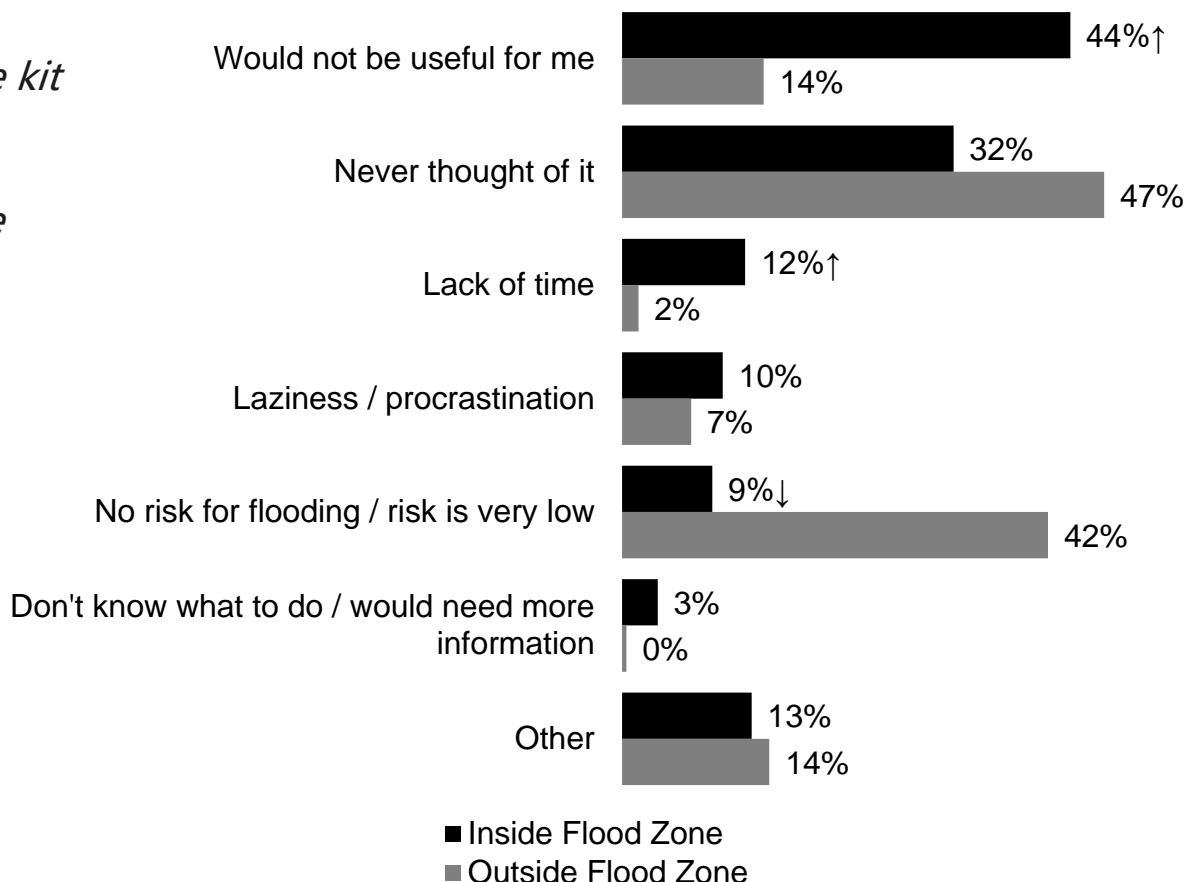
In particular in the 1:100 zone, Calgarians indicate that a grab-and-go kit would not be useful for them or that they hadn't thought of it. In the 1:200 flood zone, never having thought of it or perceived flood risk being low are the main reasons for not having created a grab-and-go kit.



Did not create kit



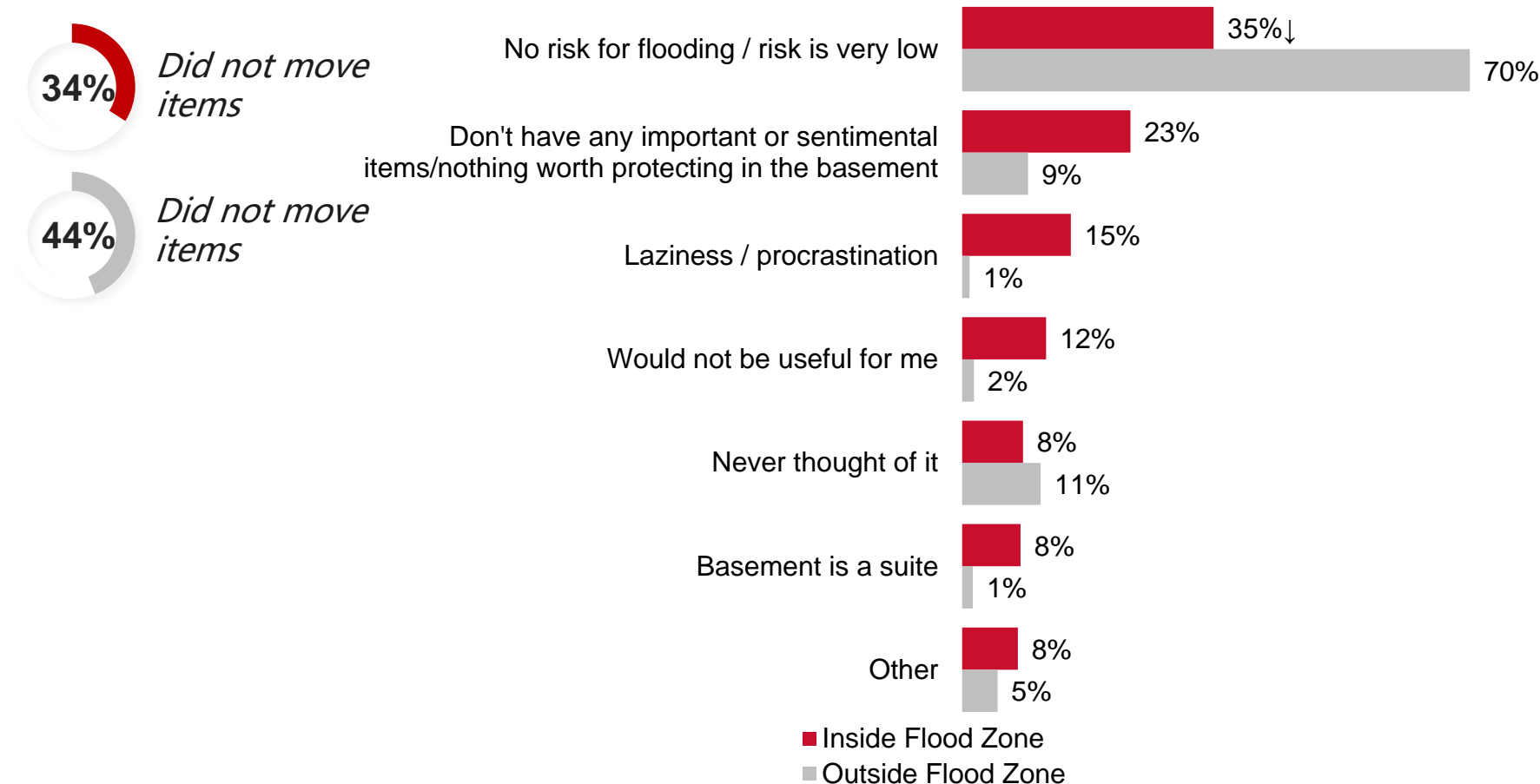
Did not create kit



↑ Significantly higher than 1:200
↓ Significantly lower than 1:200

Reasons for Not Moving Items into Waterproof Bins / out of the Basement

Having a low risk of flooding is the most common reason for not having moved items into waterproof bins or out of the basement, more so for those outside the flood zone. Almost one-quarter of those inside the flood zone feel they don't have items in the basements that are worth protecting.



Base: Did not move items into waterproof bins/out of basement (excluding Don't know/Not Applicable)
 (Inside Flood Zone n=97; Outside Flood Zone n=174)
 B4b. And would you be able to tell me your reasons for not moving important or sentimental items into waterproof bins or out of the basement?

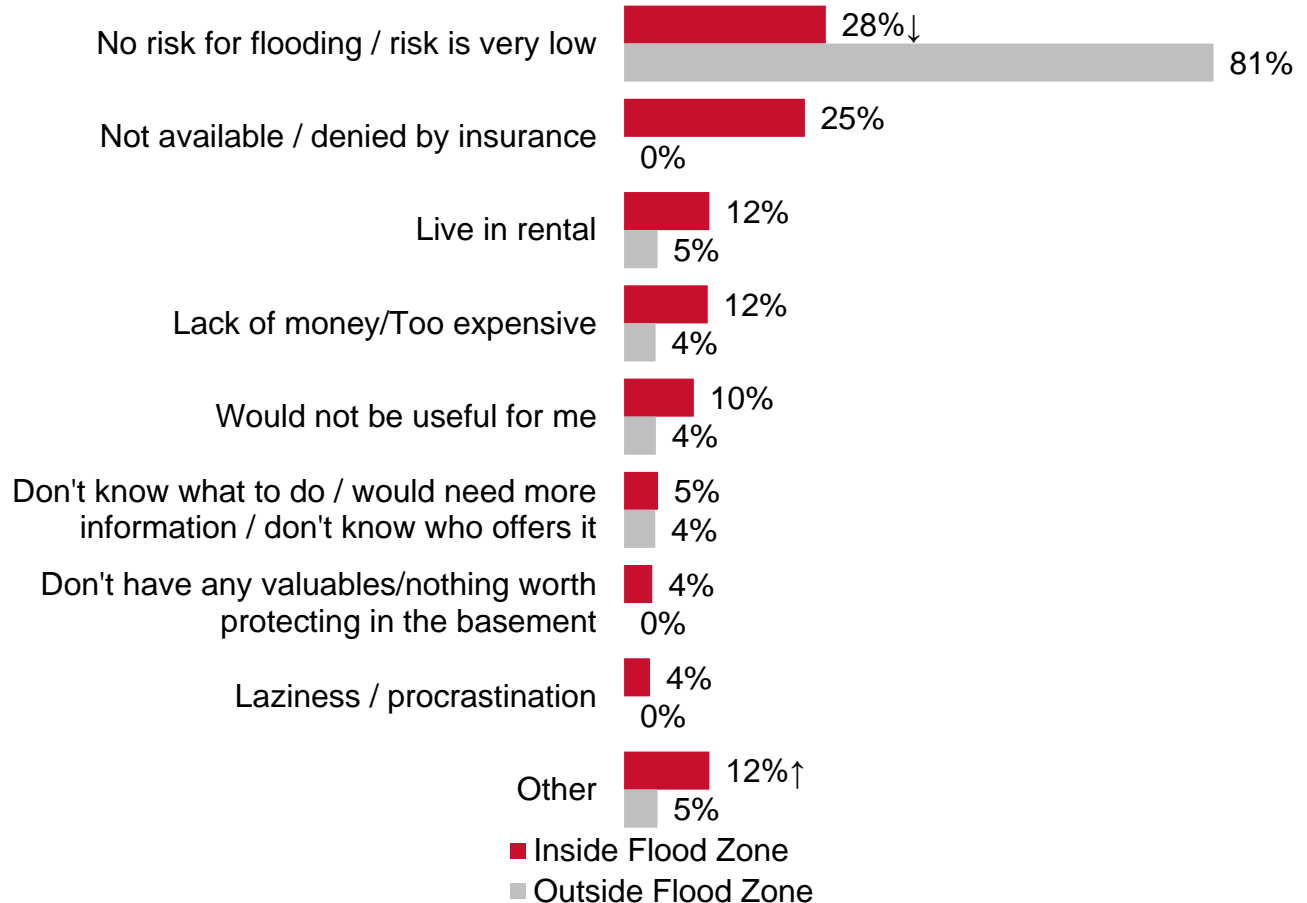
↑ Significantly higher than Outside Flood Zone
 ↓ Significantly lower than Outside Flood Zone

Reasons for Not Purchasing Overland Flood Insurance

About one-quarter of Calgarians inside the flood zone haven't purchased overland flood insurance because they perceive their flood risk to be low, while another quarter indicate that it is not available to them / that they were denied coverage.

62% *Did not purchase insurance*

61% *Did not purchase insurance*



↑ Significantly higher than Outside Flood Zone
↓ Significantly lower than Outside Flood Zone

Base: Do not have overland flood insurance (excluding Don't know/Not Applicable) (Inside Flood Zone n=159; Outside Flood Zone n=185)
B4c. And would you be able to tell me your reasons for not purchasing overland flood insurance?

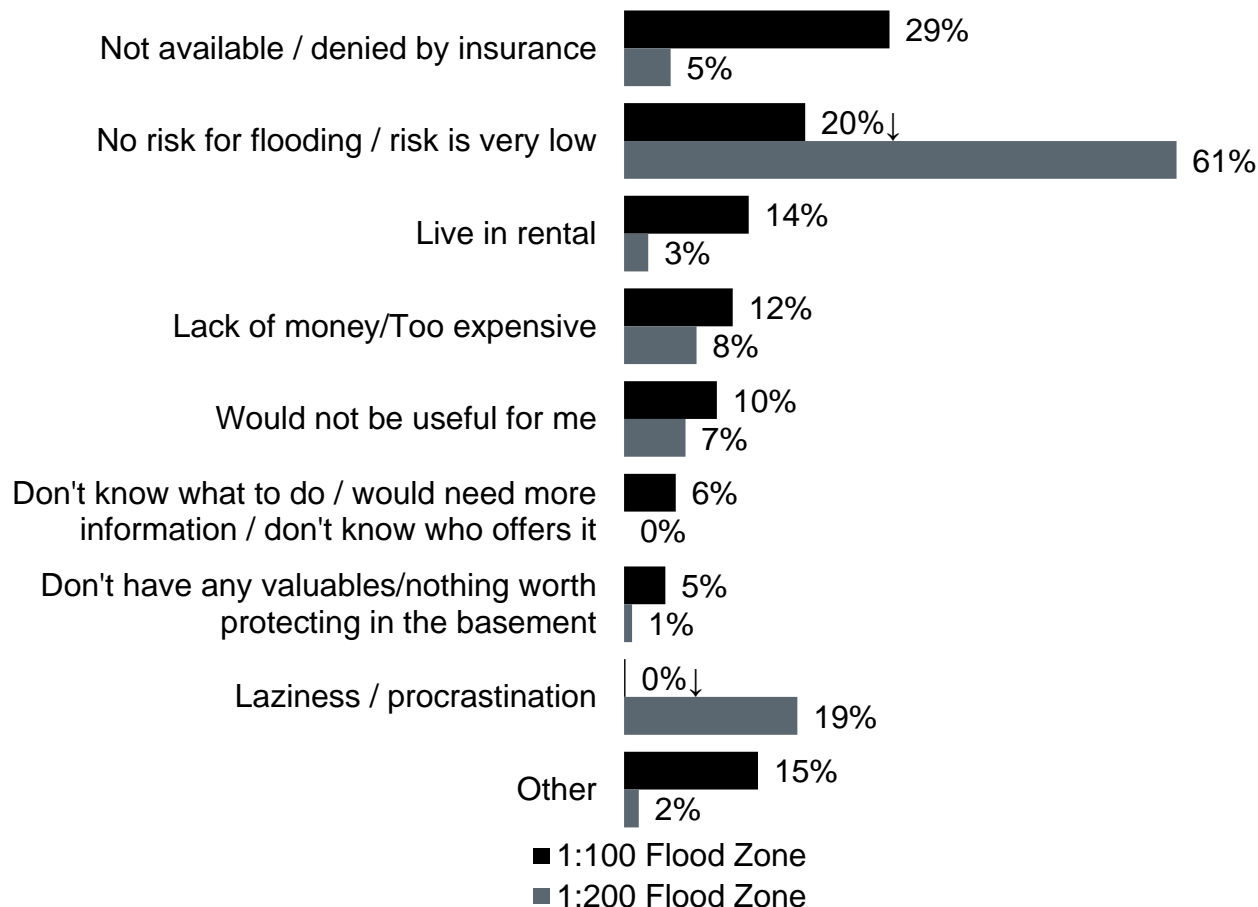
Reasons for Not Purchasing Overland Flood Insurance

1:100 vs. 1:200 (Inside Flood Zone)

In the 1:100 flood zone, 29% of residents indicate that overland flood insurance isn't available for them or that they were denied coverage. In the 1:200 flood zone, the majority haven't purchased insurance because they perceive their flood risk to be low.

61% *Did not purchase insurance*

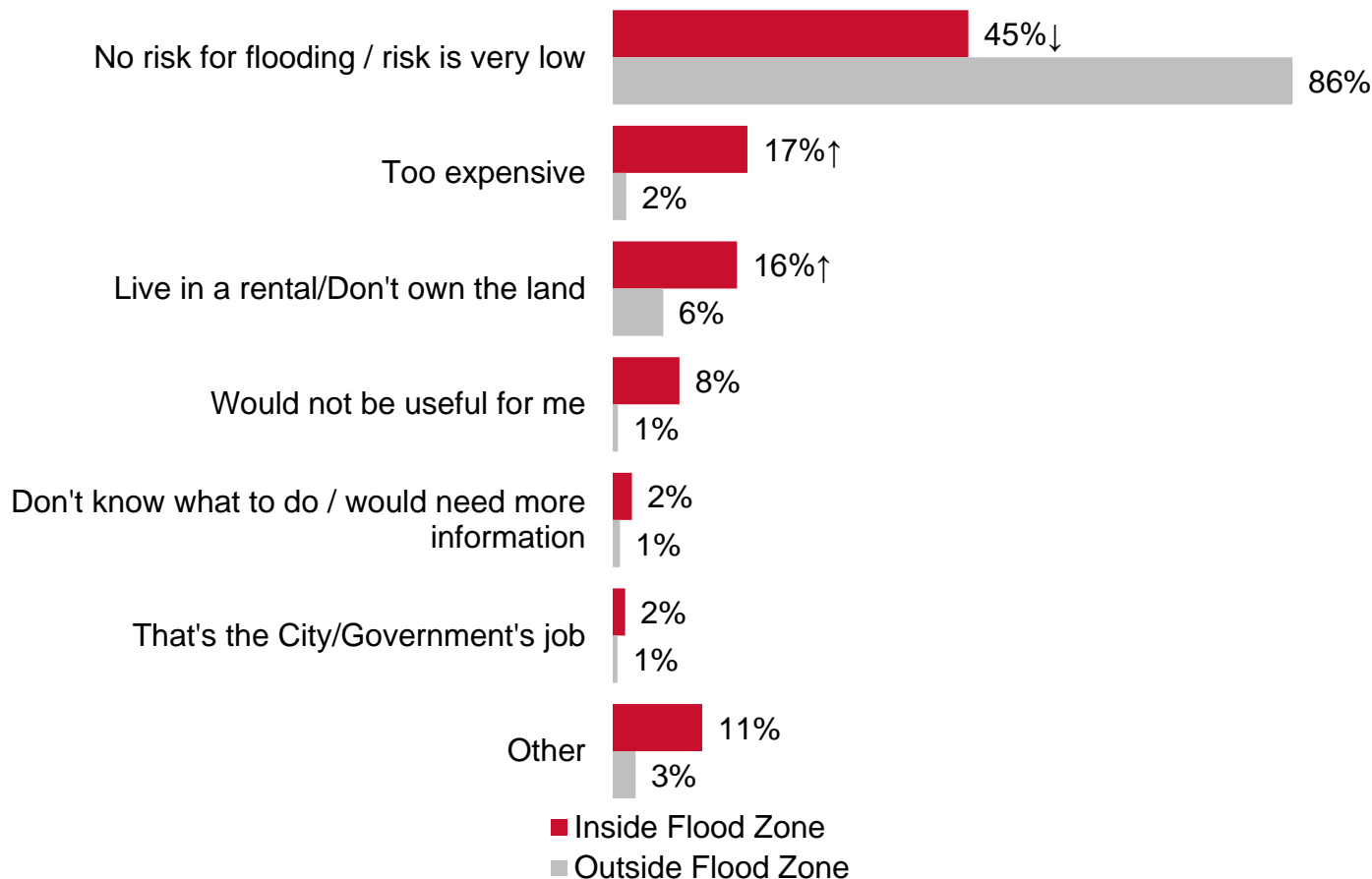
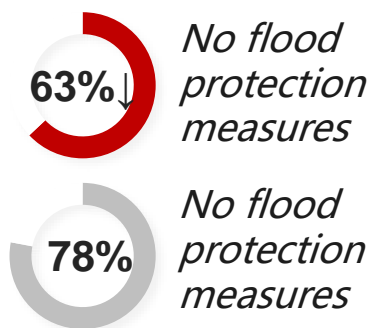
63% *Did not purchase insurance*



↑ Significantly higher than 1:200
 ↓ Significantly lower than 1:200

Reasons for Not Making Alterations to Property or Purchasing Equipment

The most common reason for not having made alterations or purchased equipment, bit inside and outside of the flood zone, is a perceived low risk of flooding. 1 in 6 residents inside the flood zone mention these measures being too expensive.



Base: Did not make alterations to property (excluding Don't know/Not Applicable) (Inside Flood Zone n=-191; Outside Flood Zone n=285) B4d. And would you be able to tell me your reasons for not making alterations to your property or purchasing equipment that you can set up to protect your property from flooding?

↑ Significantly higher than Outside Flood Zone
↓ Significantly lower than Outside Flood Zone

Reasons for Not Making Alterations to Property or Purchasing Equipment

1:100 vs. 1:200 (Inside Flood Zone)

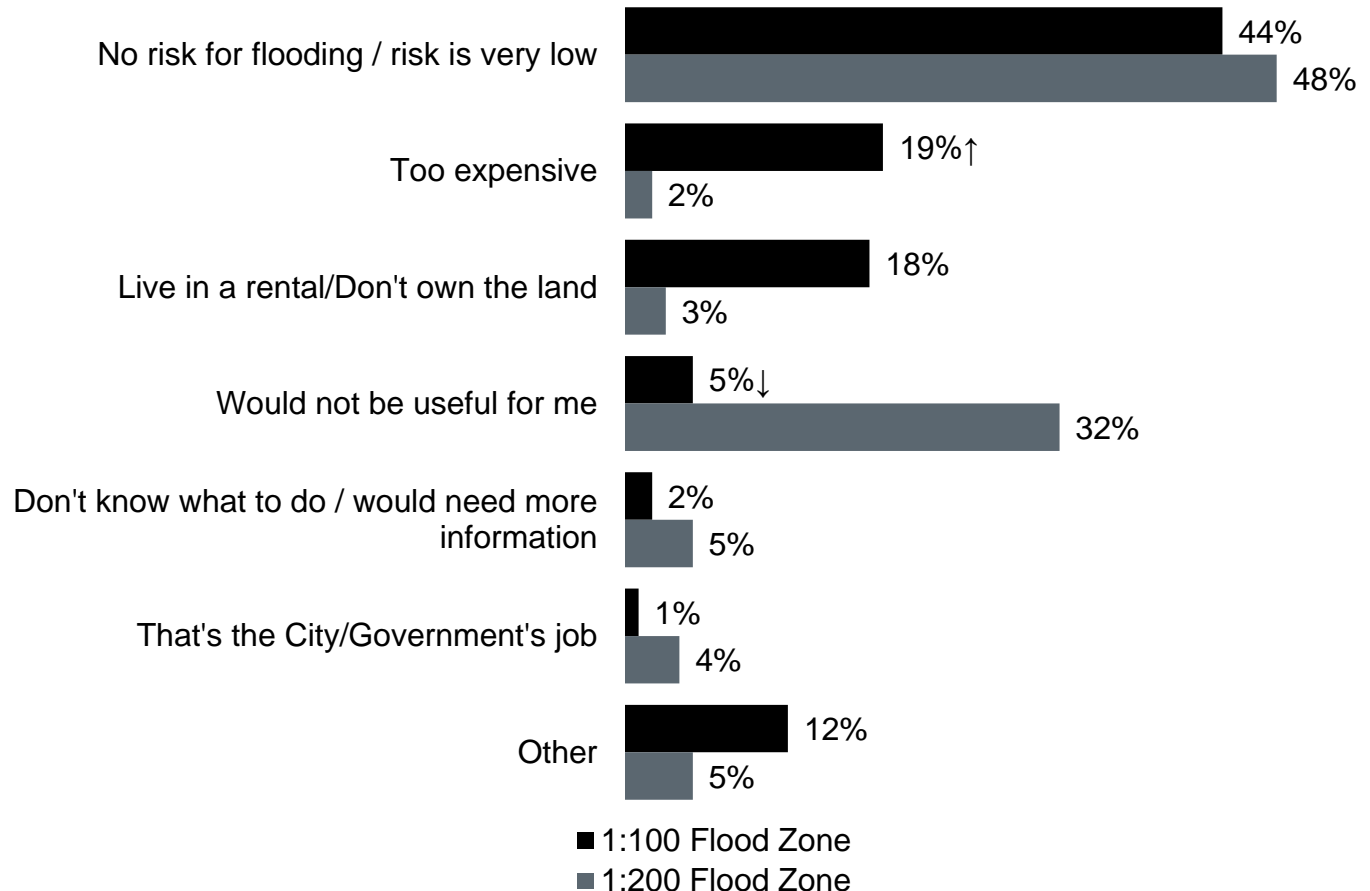
Those in the 1:100 flood zone are more likely to feel that property alterations or equipment are too expensive while those in the 1:200 flood zone are more likely to think property alterations or equipment are not useful for them.



No flood protection measures



No flood protection measures



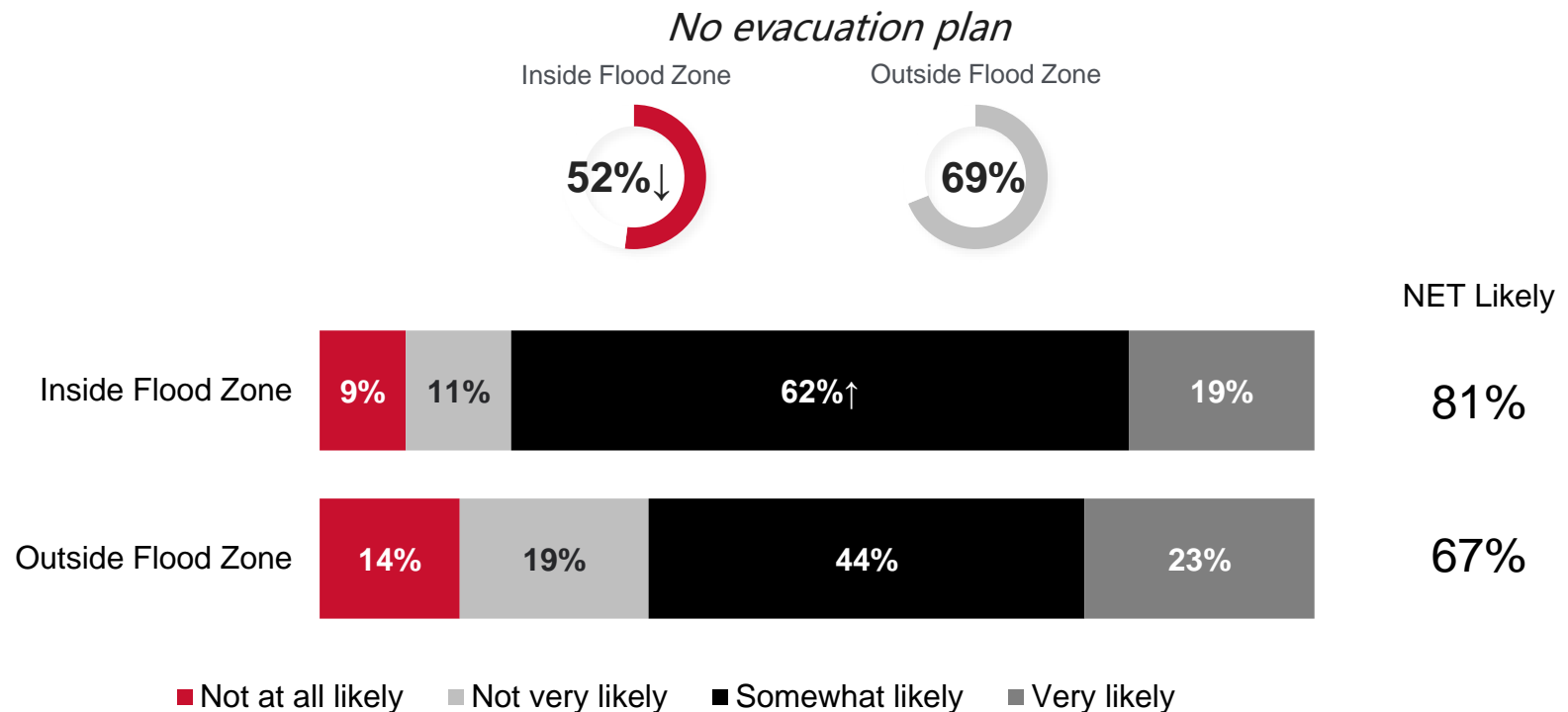
↑ Significantly higher than 1:200
 ↓ Significantly lower than 1:200

Base: Did not make alterations to property (excluding Don't know/Not Applicable) (1:100 n=141; 1:200 n=50)
 B4d. And would you be able to tell me your reasons for not making alterations to your property or purchasing equipment that you can set up to protect your property from flooding?

Likelihood to Create an Evacuation Plan if The City were to Provide Template

Inside vs. Outside Flood Zone

Among Calgarians who currently do not have an evacuation plan, a majority would be at least somewhat likely to create one if The City provided a template.



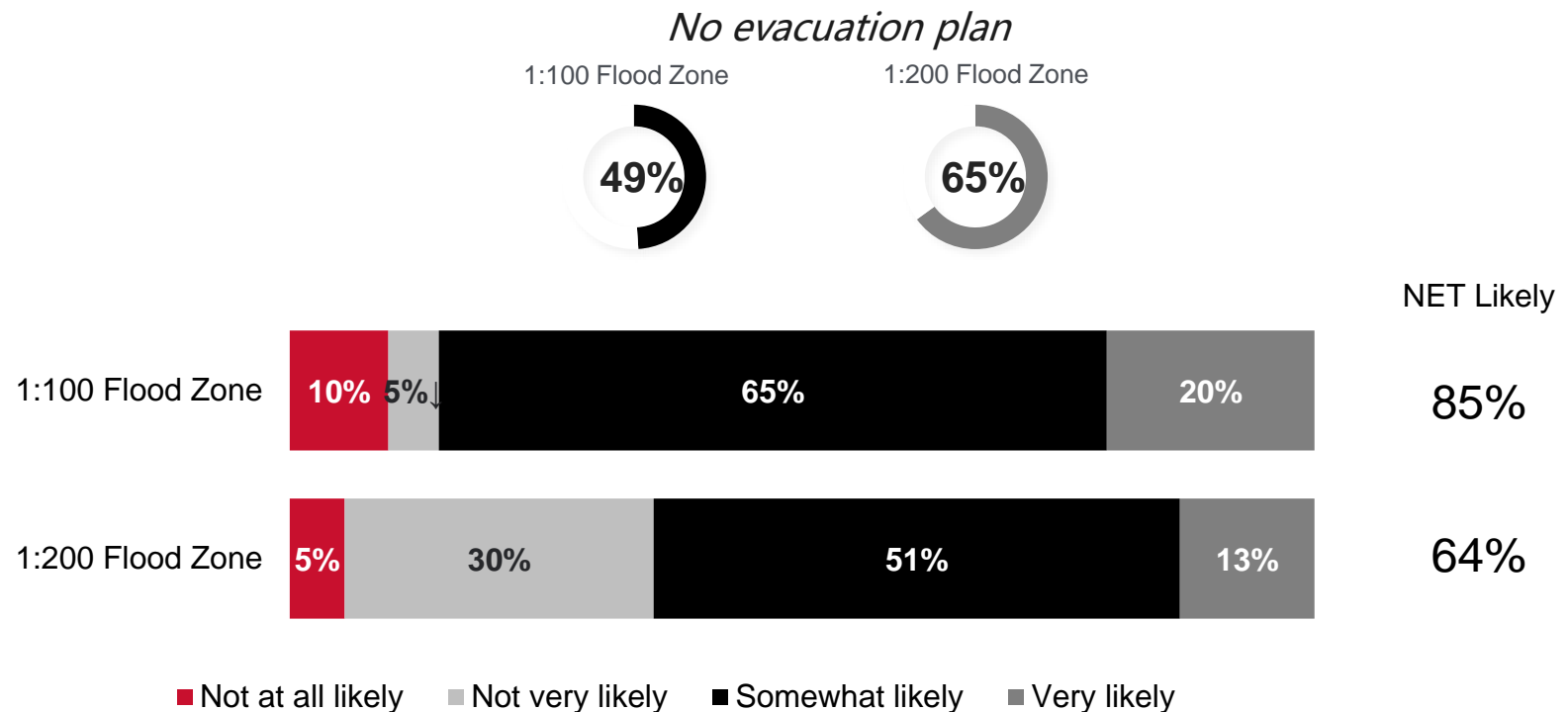
Base: Don't have an evacuation plan (excluding Don't know) (Inside Flood Zone n=167; Outside Flood Zone n=275)
 B4e1. If The City were to provide a templated evacuation plan that would walk you through the steps to develop an evacuation plan for your household, would you be very likely, somewhat likely, not very likely, or not at all likely to develop an evacuation plan?

↑ Significantly higher than Outside Flood Zone
 ↓ Significantly lower than Outside Flood Zone

Likelihood to Create an Evacuation Plan if The City were to Provide Template

1:100 vs. 1:200 (Inside Flood Zone)

Among residents in the 1:100 flood zone and who currently do not have an evacuation plan, 1 out of 5 would be very likely to create an evacuation plan if The City provided a template.



Base: Don't have an evacuation plan (excluding Don't know) (1:100 n=119; 1:200 n=48)

B4e1. If The City were to provide a templated evacuation plan that would walk you through the steps to develop an evacuation plan for your household, would you be very likely, somewhat likely, not very likely, or not at all likely to develop an evacuation plan?

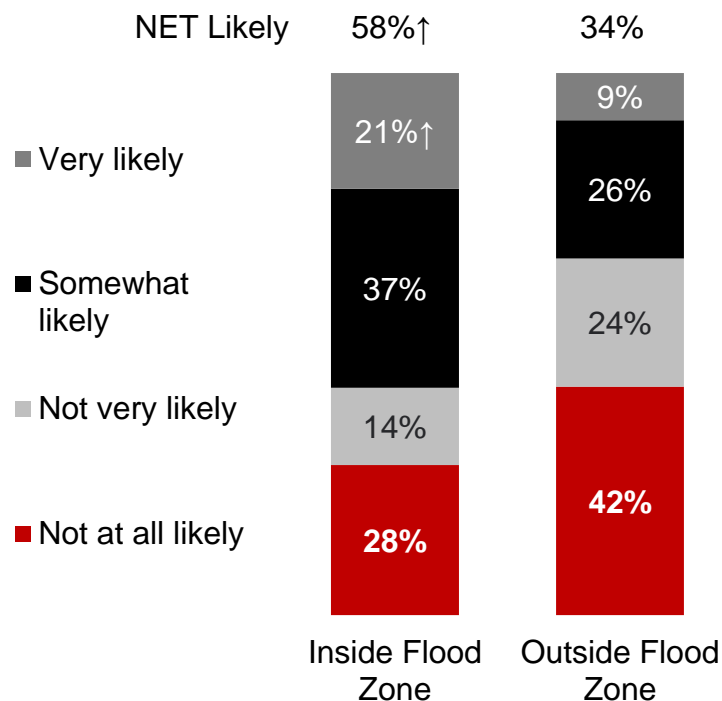
↑ Significantly higher than 1:200

↓ Significantly lower than 1:200

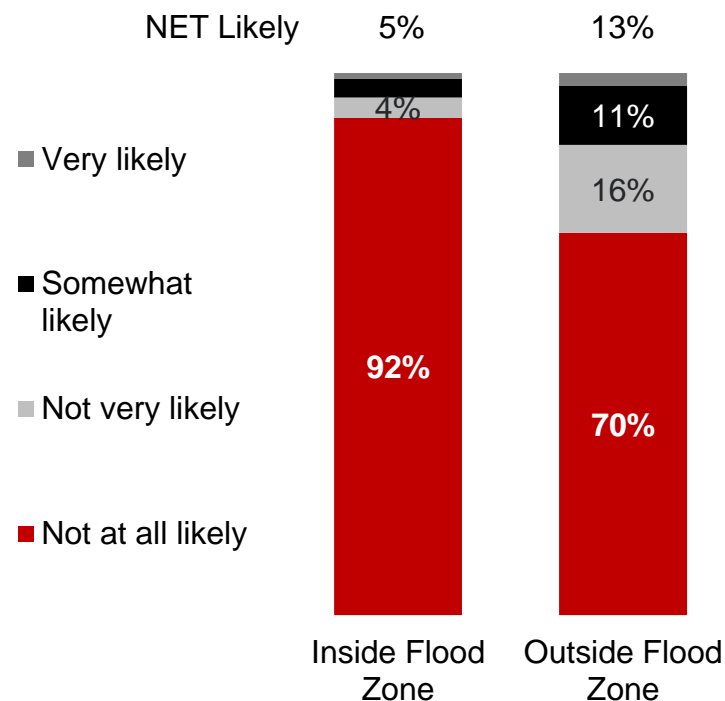
Likelihood to Install a Sump Pump ...

If The City provided simple instructions, just over half inside the flood zone who currently do not have a sump pump indicate that they would be likely to install one. Of those not at all likely, very few would install a sump pump even if The City subsidized the cost.

... if The City Were to Provide Simple Instructions



... if The City Were to Subsidize Half of the Cost



Base: Don't have a sump pump (excluding Don't know) (Inside Flood Zone n=163; Outside Flood Zone n=292)

B4f1. If The City were to provide simple instructions showing you how to have a sump pump installed, would you be very likely, somewhat likely, not very likely, or not at all likely to install a sump pump?

Base: Not at all likely to install sump pump (excluding Don't know) (Inside Flood Zone n=64; Outside Flood Zone n=126)

B4f2. And if The City were to provide a subsidy to cover half of the cost of installing a sump pump, would you be very likely, somewhat likely, not very likely, or not at all likely to install a sump pump?

↑ Significantly higher than Outside Flood Zone

↓ Significantly lower than Outside Flood Zone

Reasons for Not Installing a Sump Pump

The majority of those who would not install a sump pump even if The City subsidized the cost, would not do so because of their low perceived flood risk.

25%

*Not at all likely even if
The City covers ½
cost*

29%

*Not at all likely even if
the City covers ½ cost*

No risk for flooding /
risk is very low

60%

78%

Would not be useful for
me / don't believe it

16%

14%

would be effective

Live in rental

5%

9%

It's too much hassle

2%

1%

Other

21%

2%

■ Inside Flood Zone

■ Outside Flood Zone

Base: Not at all likely to install a sump pump (excluding Don't know/Not Applicable) (Inside Flood Zone n=53; Outside Flood Zone n=92)

B4f3. What makes you unlikely to install a sump pump?

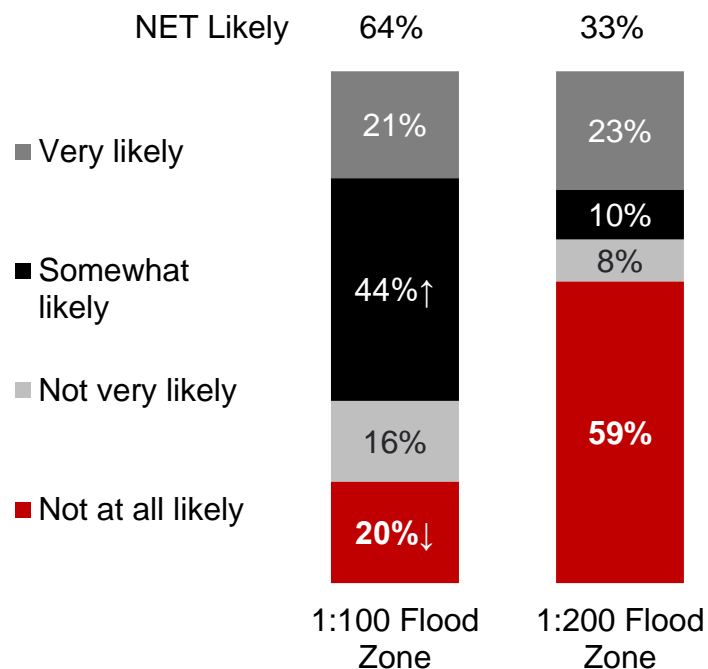
↑ Significantly higher than Outside Flood Zone

↓ Significantly lower than Outside Flood Zone

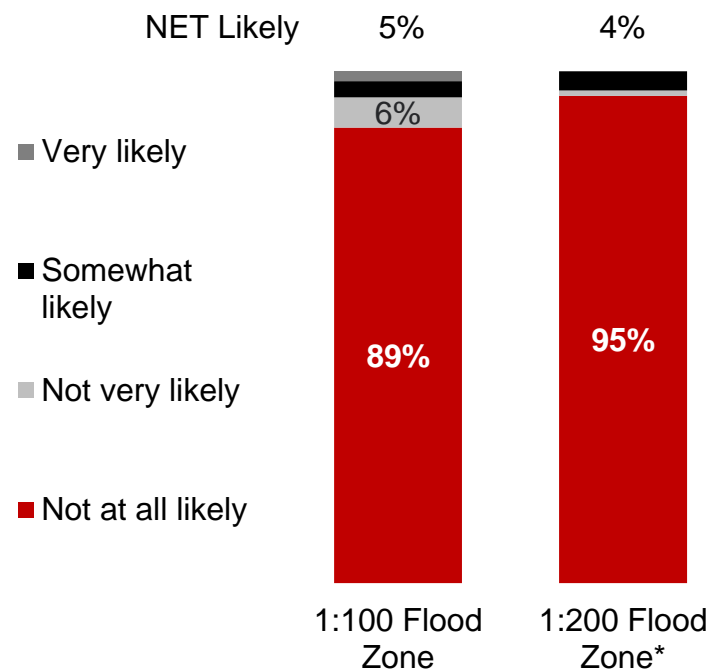
Likelihood to Install a Sump Pump

Almost two-thirds of those in the 1:100 flood zone who currently do not have a sump pump would be likely to install one if The City provided simple instructions, compared to just one-third of those in the 1:200 flood zone.

... if The City Were to Provide Simple Instructions



... if The City Were to Subsidize Half of the Cost



Base: Don't have a sump pump (excluding Don't know) (1:100 n=117; 1:200 n=46)

B4f1. If The City were to provide simple instructions showing you how to have a sump pump installed, would you be very likely, somewhat likely, not very likely, or not at all likely to install a sump pump?

Base: Not at all likely to install sump pump (excluding Don't know) (1:100 n=39; 1:200 n=25)

B4f2. And if The City were to provide a subsidy to cover half of the cost of installing a sump pump, would you be very likely, somewhat likely, not very likely, or not at all likely to install a sump pump?

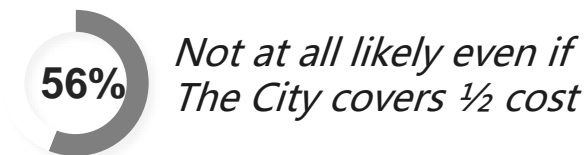
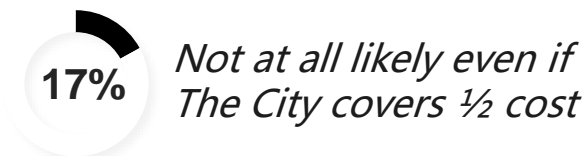
* Base <30, interpret with caution

↑ Significantly higher than 1:200

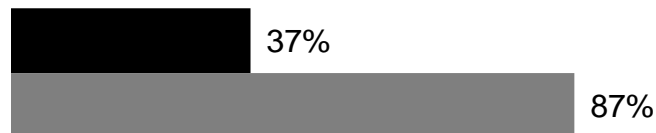
↓ Significantly lower than 1:200

Reasons for Not Installing a Sump Pump

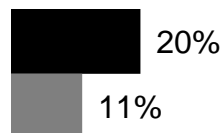
The majority of those in the 1:200 flood zone who would not install a sump pump even if The City subsidized the cost, would not do so because of their low perceived flood risk. In the 1:100 flood zone, the reasons for not doing so are varied.



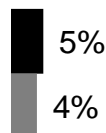
No risk for flooding / risk is very low



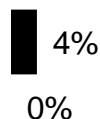
Would not be useful for me / don't believe it would be effective



Live in rental



It's too much hassle



Other



■ 1:100 Flood Zone
■ 1:200 Flood Zone*

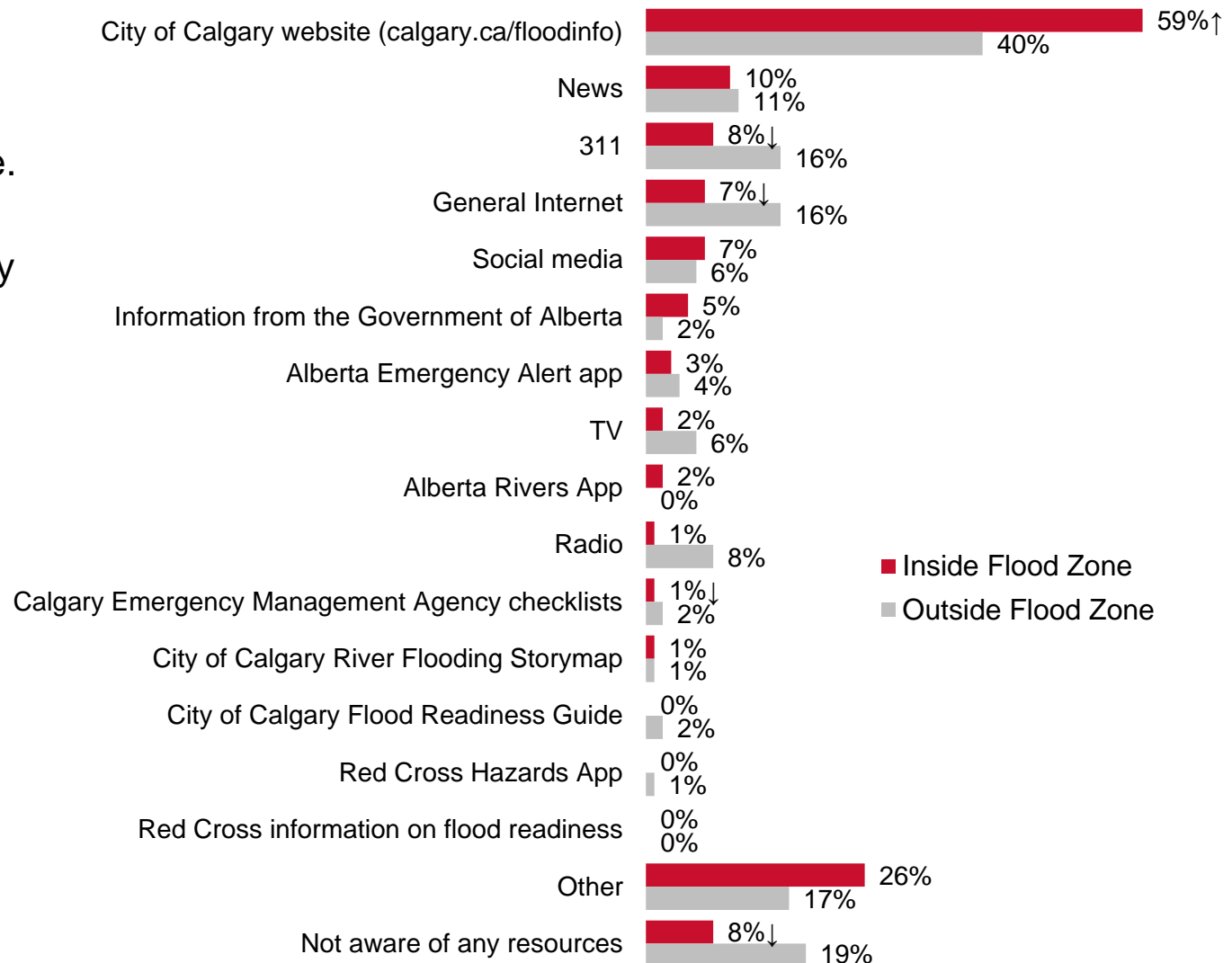
* Base <30, interpret with caution
↑ Significantly higher than 1:200
↓ Significantly lower than 1:200

Base: Not at all likely to install a sump pump (excluding Don't know/Not Applicable) (1:100 n=32; 1:200 n=21)
B4f3. What makes you unlikely to install a sump pump?



Detailed Findings: Flood Support

The City of Calgary website is by far the best known flood preparedness resource. There is much lower awareness of other City resources such as the River Flooding Story map, the Readiness Guide, and CEMA checklists.



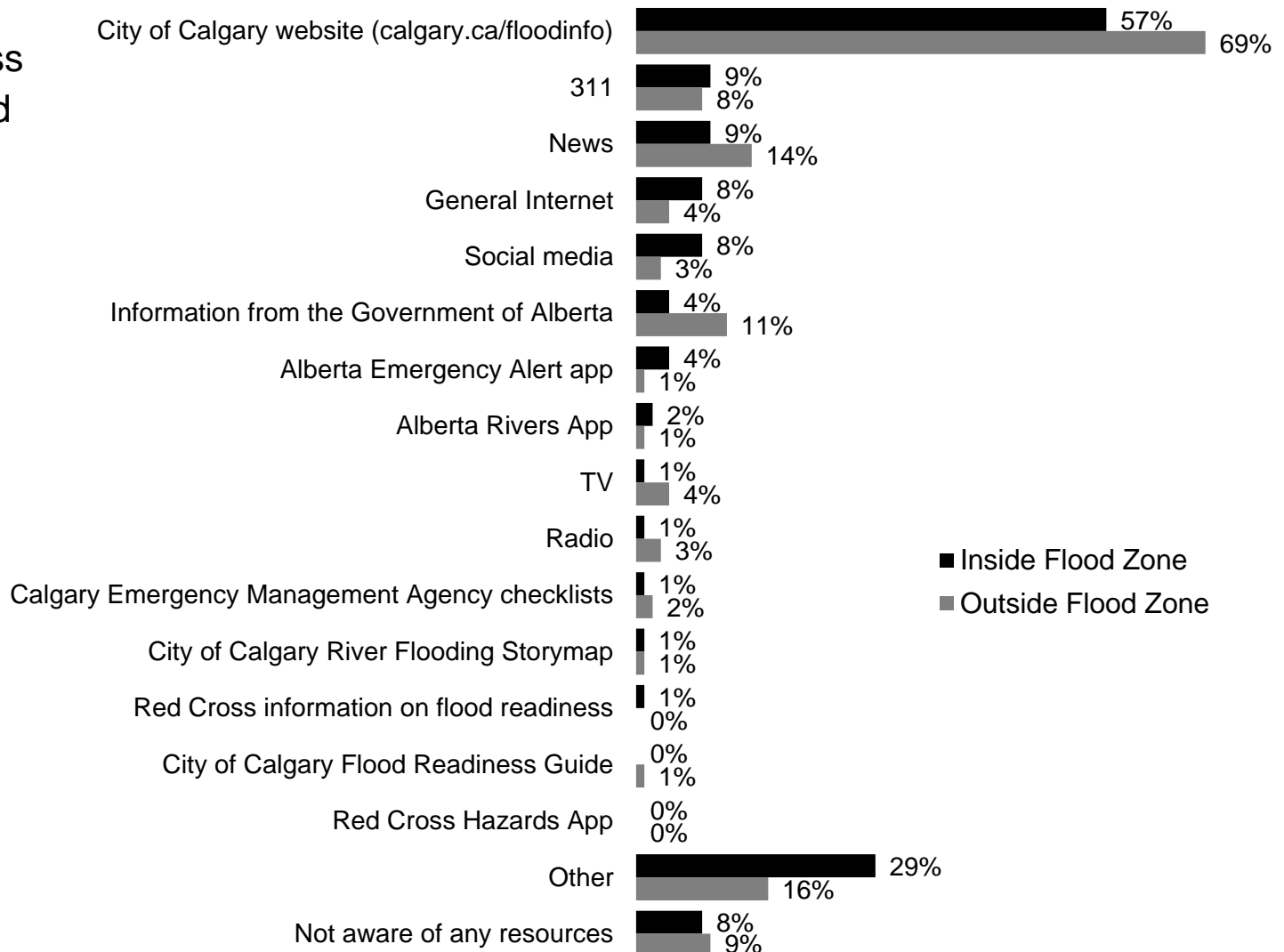
Base: All respondents (excluding Don't know) (Inside Flood Zone n=372; Outside Flood Zone n=376)

C2a. What resources are you aware of that provide information to help you be more prepared for potential river flooding at your property or handle other disruptions caused by potential river flooding in our city?

Awareness of Flood Preparedness Resources

1:100 vs. 1:200 (Inside Flood Zone)

There are similar levels of awareness of the various flood preparedness resources among those in the 1:100 and 1:200 flood zones.



■ Inside Flood Zone
■ Outside Flood Zone

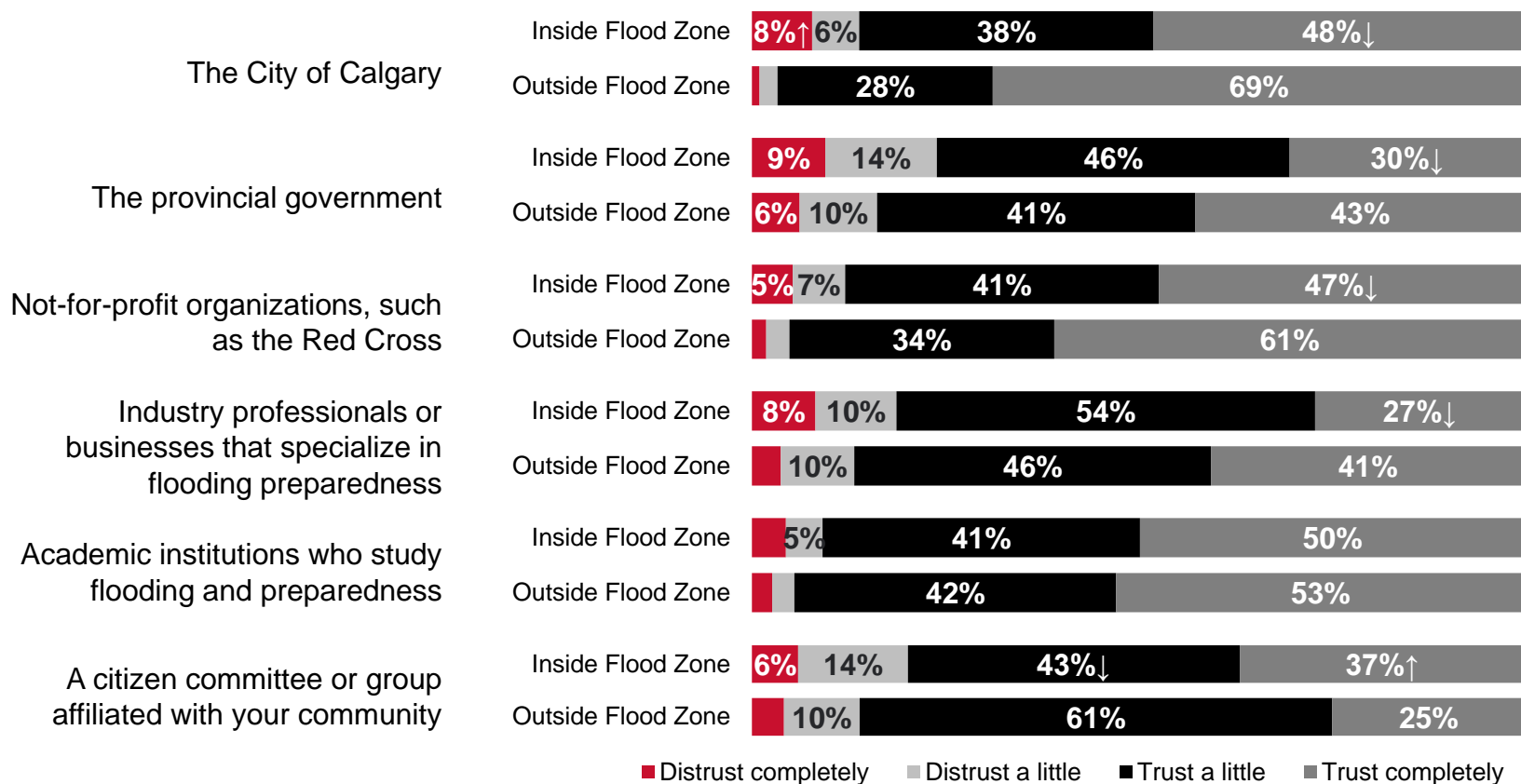
↑ Significantly higher than 1:200
↓ Significantly lower than 1:200

Base: All respondents (excluding Don't know) (1:100 n=277; 1:200 n=95)

C2a. What resources are you aware of that provide information to help you be more prepared for potential river flooding at your property or handle other disruptions caused by potential river flooding in our city?

Trust in Specific Organizations

Efforts to increase trust among citizens inside the flood zone would be useful: compared to those outside the flood zone, those inside the flood zone have substantially lower levels of trust in The City of Calgary and not-for-profit organizations.



Base: All respondents (excluding Refused/Don't know) (Inside Flood Zone n=369-396; Outside Flood Zone n=384-401)

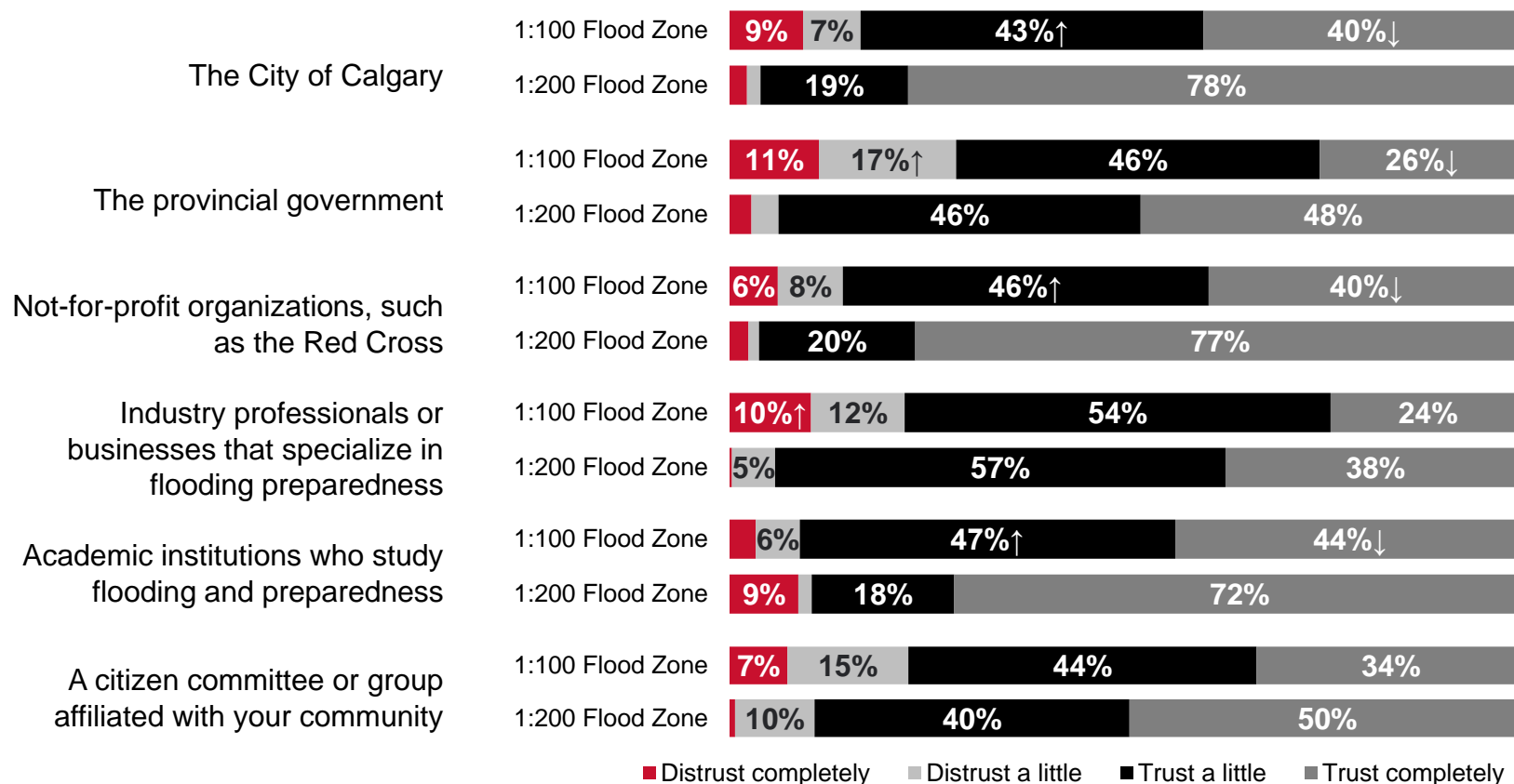
C3. Next, I will read out a list of different types of organizations. Please let me know how much you would trust or not trust each of these to provide you with reliable information about the risks of potential river flooding and how to prepare for potential river flooding. Would you say ...

↑ Significantly higher than Outside Flood Zone

↓ Significantly lower than Outside Flood Zone

Trust in Specific Organizations

Especially in the 1:100 flood zone, there are lower levels of trust in The City of Calgary, the provincial government, not-for-profits, and academic institutions.



Base: All respondents (excluding Refused/Don't know) (1:100 n=271-296; 1:200 n=96-100)

C3. Next, I will read out a list of different types of organizations. Please let me know how much you would trust or not trust each of these to provide you with reliable information about the risks of potential river flooding and how to prepare for potential river flooding. Would you say ...

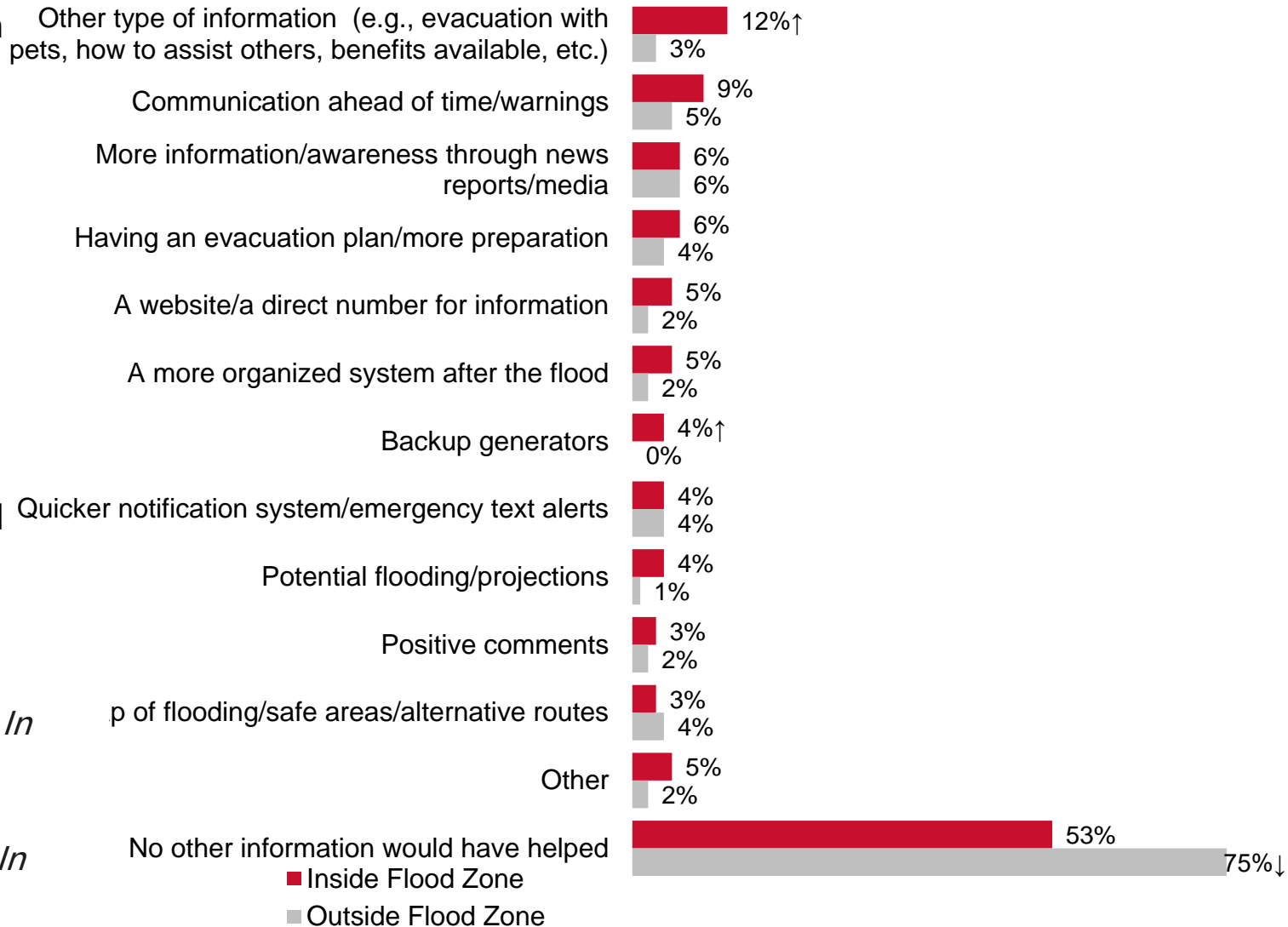
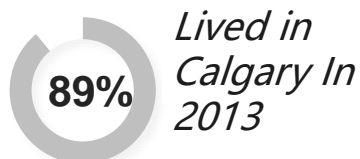
↑ Significantly higher than 1:200

↓ Significantly lower than 1:200

Information That Would Have Been Helpful Before / During / After 2013 Flood

Inside vs. Outside Flood Zone

For those living in Calgary in 2013, three-quarters of those living outside of the flood zone and just over half of those inside the flood zone felt that no other information would have helped them.



Base: Lived in Calgary in 2013 (excluding Don't know/Not Applicable/None) (Inside Flood Zone n=357; Outside Flood Zone n=331)
C1b. Thinking back to the 2013 flood, is there any information or resources that would have helped you be more prepared, or that would have made your response, recovery, or your overall experience during that time go smoothly?

↑ Significantly higher than Outside Flood Zone
↓ Significantly lower than Outside Flood Zone

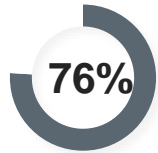
Information That Would Have Been Helpful Before / During / After 2013 Flood

1:100 vs. 1:200 (Inside Flood Zone)

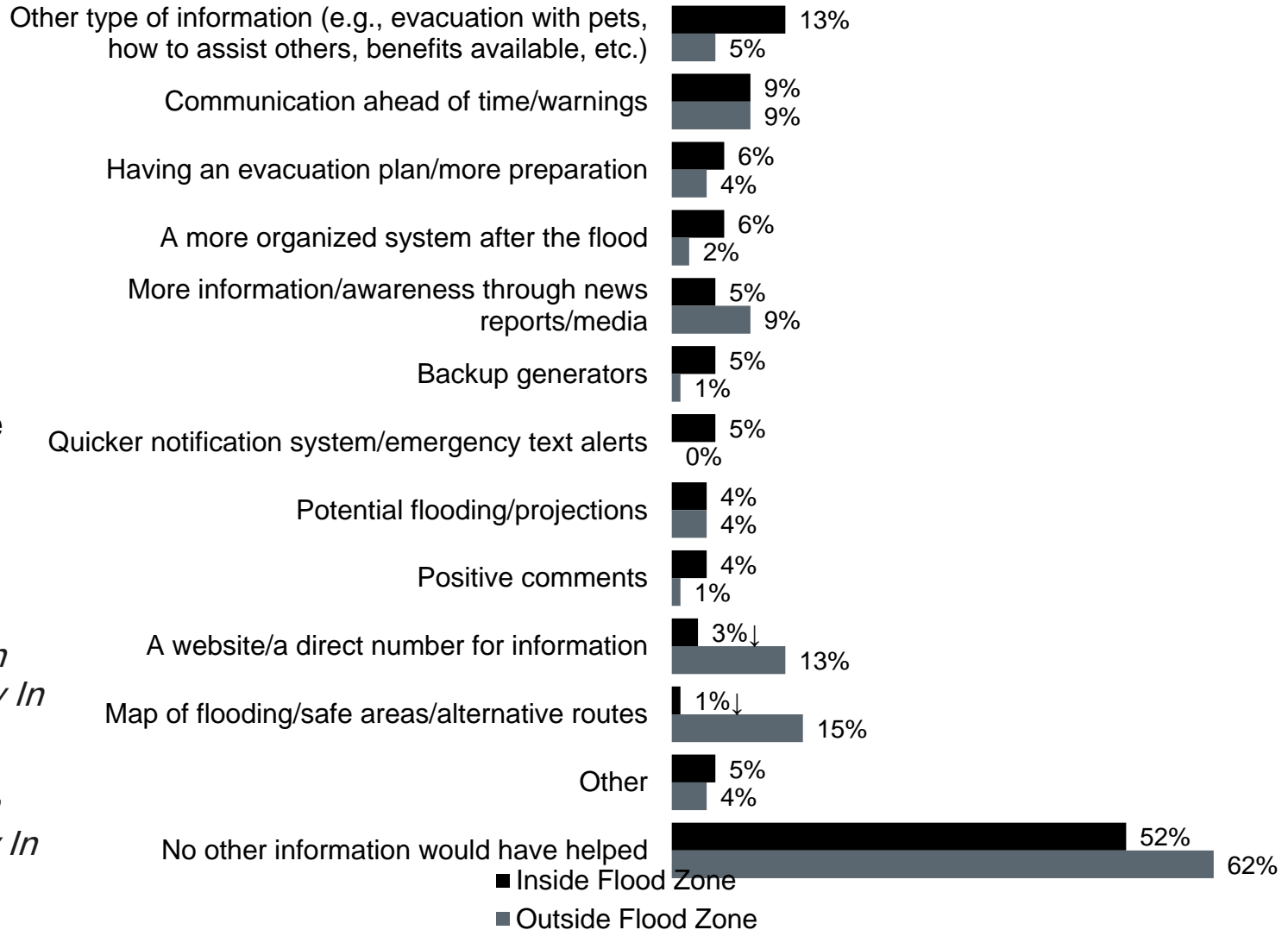
Compared to those in the 1:100 zone, those in the 1:200 zone are more likely to have found flood maps and a website or phone number for information helpful.



Lived in Calgary In 2013



Lived in Calgary In 2013



Base: Lived in Calgary in 2013 (excluding Don't know/Not Applicable) (1:100 n=272; 1:200 n=85)

C1b. Thinking back to the 2013 flood, is there any information or resources that would have helped you be more prepared, or that would have made your response, recovery, or your overall experience during that time go smoothly?

↑ Significantly higher than 1:200

↓ Significantly lower than 1:200

Information to Prepare for Potential Flooding

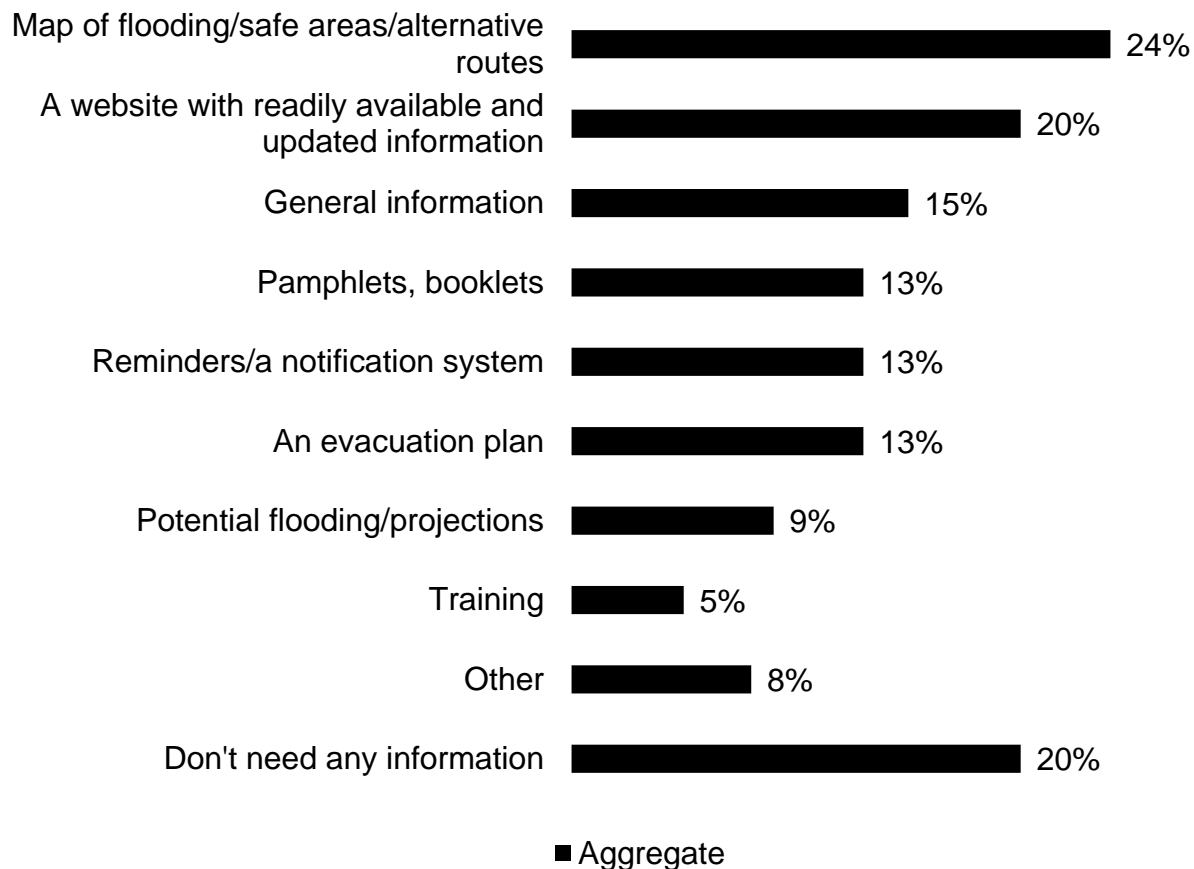
Those who did not live in Calgary in 2013 mention maps (24%) and a website with current information (20%) most frequently as being useful to prepare for potential flooding. 1 out of 5 indicate they don't need any information.

12%

*Did not live in
Calgary In 2013*

11%

*Did not live in
Calgary In 2013*



Base: Did not live in Calgary in 2013(excluding Don't know/Not Applicable) (n=40)

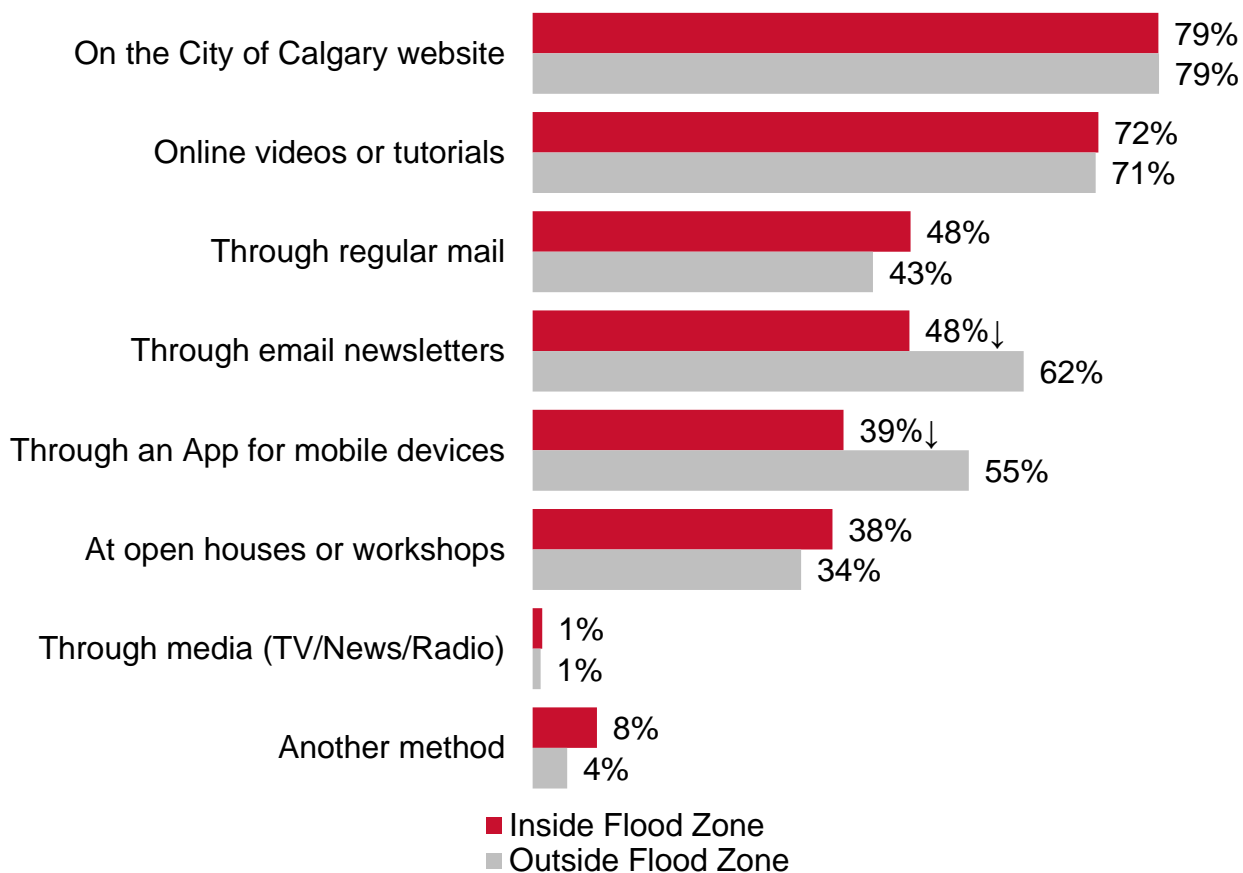
C1a. What support or information would be helpful to you to prepare for potential river flooding either at your property, or in our city?

↑ Significantly higher than Outside Flood Zone

↓ Significantly lower than Outside Flood Zone

Preferred Resource Communication Channels

A range of communication methods would be preferred to communicate additional flood preparedness information, with The City of Calgary website and online videos or tutorials being most preferred.



Base: Did not live in Calgary in 2013 (excluding Don't know) (Inside Flood Zone n=395; Outside Flood Zone n=397)

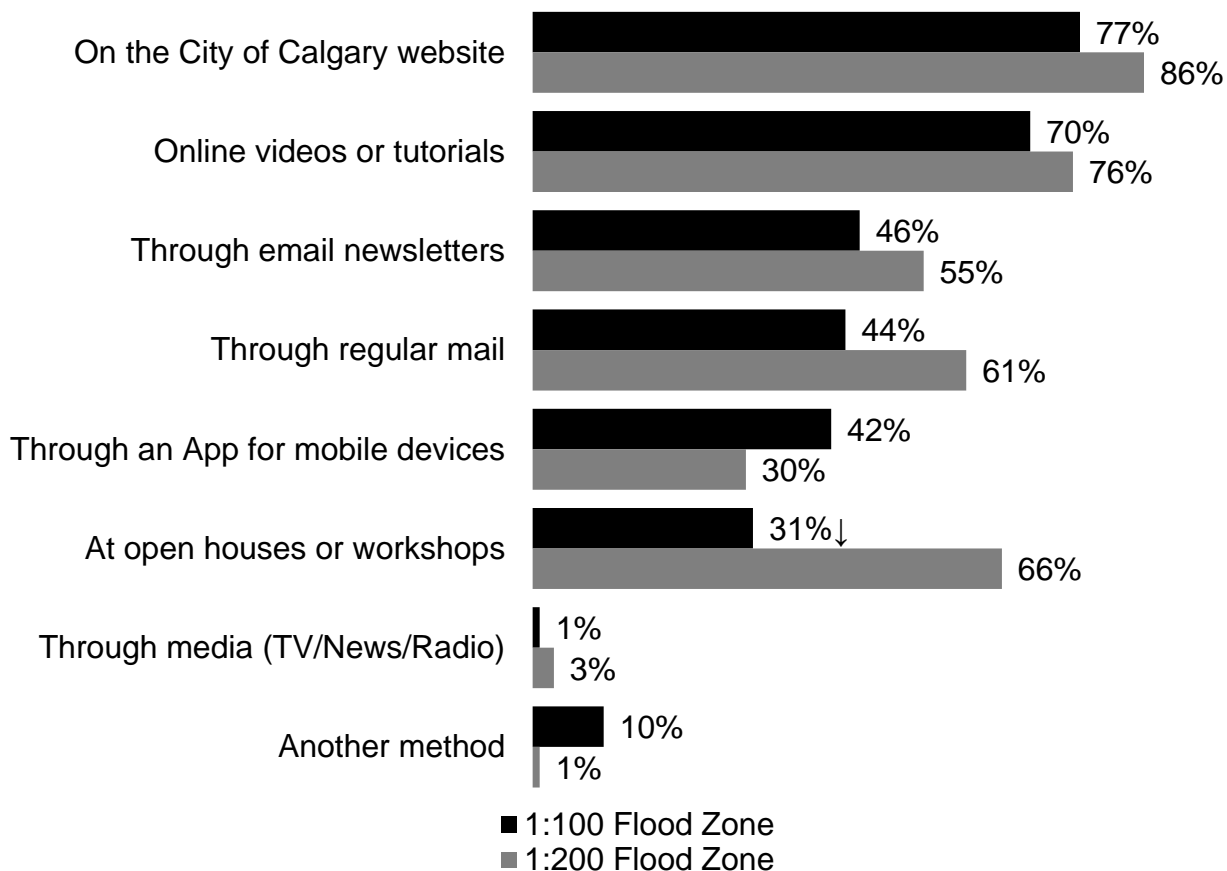
C4a. If The City were to develop additional resources with information, how would you prefer that they make those resources available to you?

↑ Significantly higher than Outside Flood Zone

↓ Significantly lower than Outside Flood Zone

Preferred Resource Communication Channels

The City of Calgary website and online videos or tutorials are the preferred methods of communication in both the 1:100 and 1:200 flood zones. Those in the 1:200 zone are more likely to prefer open houses or workshops than those in the 1:100 flood zone.



Base: All respondents (excluding Don't know) (1:100 n=294; 1:200 n=101)

C4a. If The City were to develop additional resources with information about how to prepare for potential river flooding and to lower your risk of future flood damage, how would you prefer that they make those resources available to you?

↑ Significantly higher than 1:200

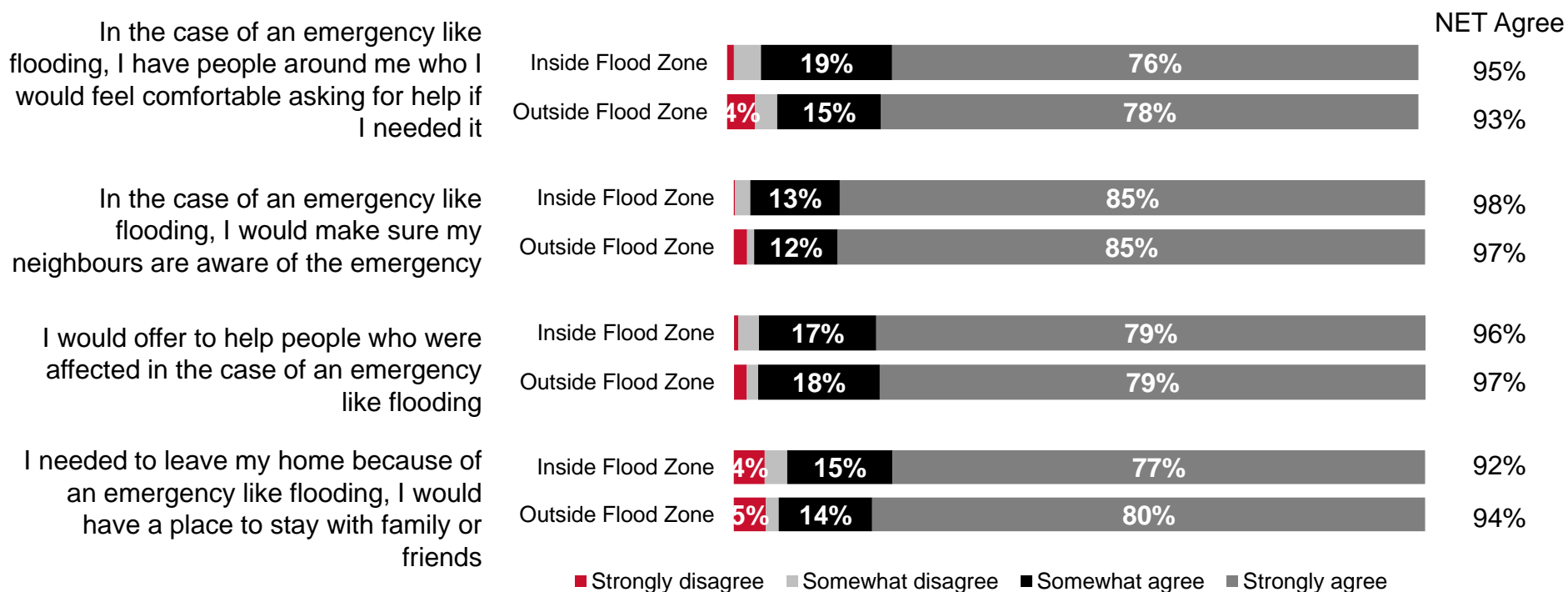
↓ Significantly lower than 1:200



Detailed Findings: Social Resiliency and Mental Health Support

Community Support

In light of high levels of community supports, it would be helpful to engage local communities to increase flood preparedness.



Base: All respondents (excluding Don't know) (Inside Flood Zone n=393-399; Outside Flood Zone n=400-401)

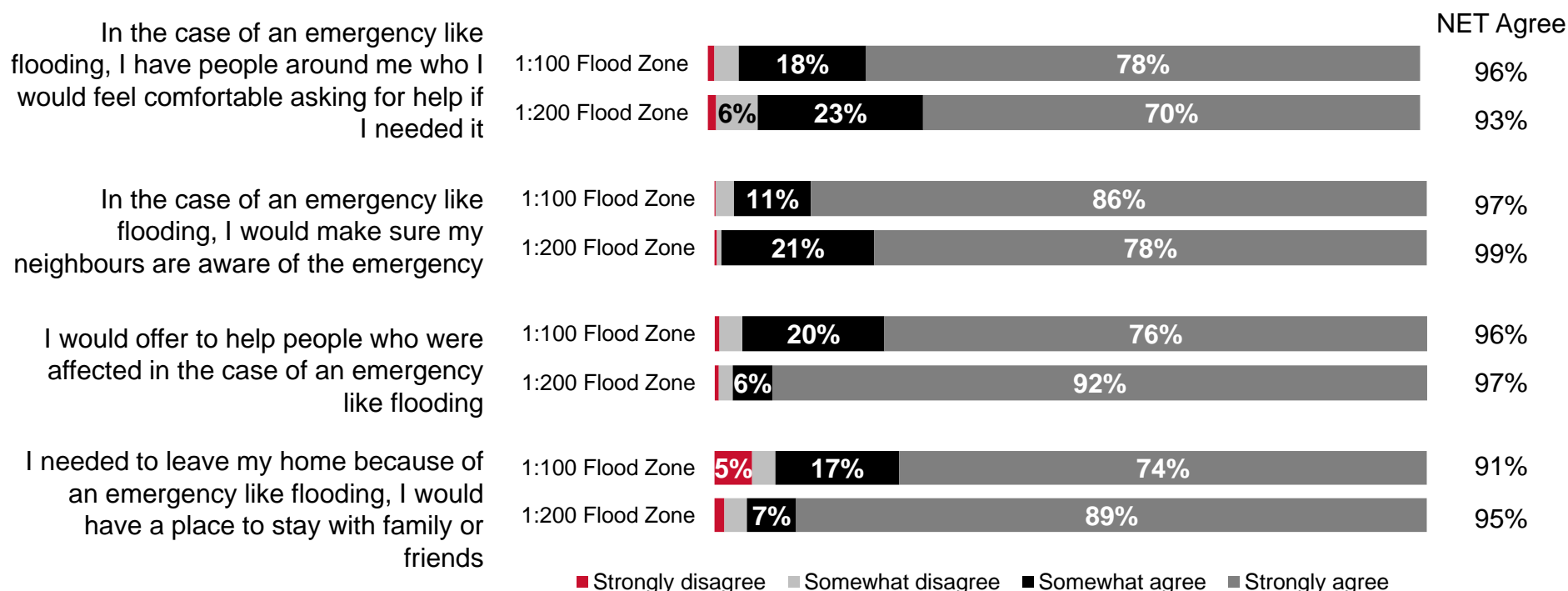
D1. For each of the following statements, please let me know if you strongly agree, somewhat agree, somewhat disagree, or strongly disagree.

↑ Significantly higher than Outside Flood Zone

↓ Significantly lower than Outside Flood Zone

Community Support

The high levels of community support hold true in both the 1:100 and 1:200 flood zones.

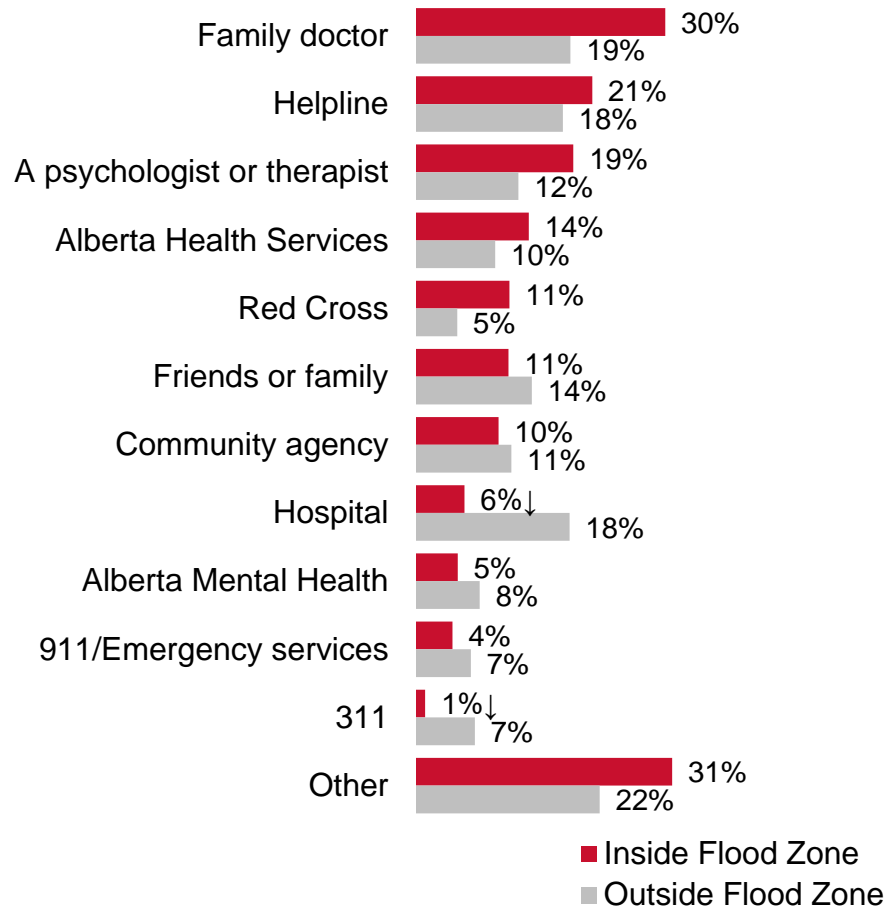


↑ Significantly higher than 1:200
 ↓ Significantly lower than 1:200

Base: All respondents (excluding Don't know) (1:100 n=293-298; 1:200 n=99-101)

D1. For each of the following statements, please let me know if you strongly agree, somewhat agree, somewhat disagree, or strongly disagree.

For those inside the flood zone, family doctors have the highest level of awareness as a mental health resource. For those outside the flood zone, family doctors, helplines, and the hospital have similar levels of awareness.



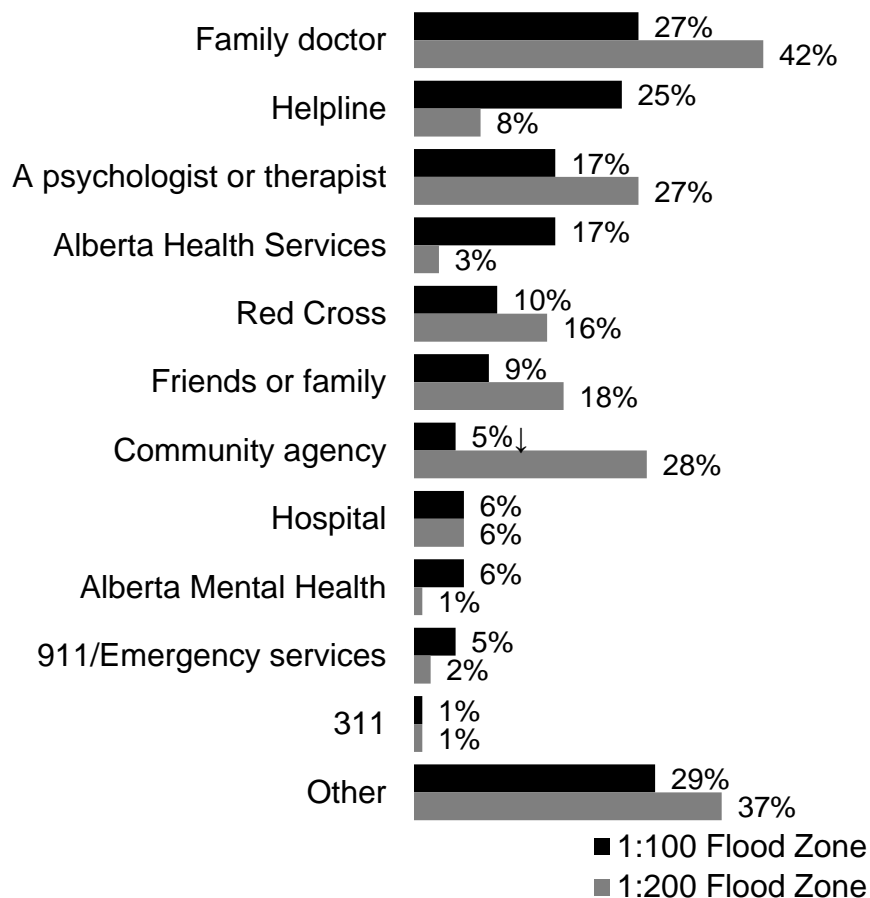
Base: All respondents (excluding Don't know) (Inside Flood Zone n=263; Outside Flood Zone n=250)

D3. Which resources, if any, are you aware of that you can access for help if you or someone you know were to experience a mental health issue due to trauma from an experience like a flood?

↑ Significantly higher than Outside Flood Zone

↓ Significantly lower than Outside Flood Zone

For those in the 1:200 flood zone, family doctors, followed by community agencies and psychologists have the highest levels of awareness as mental health resources. In the 1:100 flood zone, family doctors and helplines have the highest levels of awareness.



Base: All respondents (excluding Don't know) (1:100 n=196; 1:200 n=67)

D3. Which resources, if any, are you aware of that you can access for help if you or someone you know were to experience a mental health issue due to trauma from an experience like a flood?

↑ Significantly higher than 1:200

↓ Significantly lower than 1:200



Demographics

Quadrant and Flood Impact

Quadrant

	Inside Flood Zone	Outside Flood Zone
Southwest	59%↑	27%
Southeast	12%↓	24%
Northwest	27%	32%
Northeast	2%↓	17%

Live in Calgary during 2013 Flood (A4)

	Inside Flood Zone	Outside Flood Zone
Yes	88%	89%
No	12%	11%
Don't know	0%	0%

Did your residence get flooded? (A5)

	Inside Flood Zone	Outside Flood Zone
Yes	46%↑	4%
No	54%↓	96%
Don't know	0%	0%

Impact of 2013 Flood (A6)

	Inside Flood Zone	Outside Flood Zone
Emotional or psychological stress	51%↑	24%
Evacuation from your residence	72%↑	10%
Financial burden or stress	39%↑	10%
Health impacts or injury	9%↑	1%
Loss of important personal belongings	30%↑	3%
Property damage	36%↑	3%
Disruption to work, school, or daycare	59%↑	43%
Disruption to commuting routes or recreation	67%↑	47%
Anything else	6%	3%
None of the above	9%↓	35%
Don't know	0%	0%

Base: All respondents (Inside Flood Zone n=401 Outside Flood Zone n=402)

A4. Did you live in Calgary during the 2013 flood?

Base: Lived in Calgary during 2013 flood (Inside Flood Zone n=389; Outside Flood Zone n=366)

A5. Did the residence you lived in at the time of the flood get flooded?

A6. Did you experience any of the following as a result of the 2013 flood?

↑ Significantly higher than Outside Flood Zone

↓ Significantly lower than Outside Flood Zone

Type of Home (E4)

	Inside Flood Zone	Outside Flood Zone
Single, detached house	52%↓	69%
Duplex, triplex, or fourplex	6%	8%
Townhouse or rowhouse	3%↓	10%
Apartment or apartment-style condominium	39%↑	11%
Another type of multi-unit complex	0%	2%
Prefer not to say	0%	0%

Own or Rent (E5)

	Inside Flood Zone	Outside Flood Zone
Own	69%	76%
Rent	31%	22%
Other	0%	1%
Prefer not to say	0%	1%

Basement ever flooded? (A10)

	Inside Flood Zone	Outside Flood Zone
Yes	68%↑	20%
No	32%↓	76%
Don't know	0%↓	3%
Not applicable	0%	1%

Have dependents? (E7)

	Inside Flood Zone	Outside Flood Zone
Yes	33%↓	49%
No	67%↑	51%
Prefer not to answer	0%	0%

Base: All respondents (Inside Flood Zone n=401; Outside Flood Zone n=402)

E4. What type of home do you live in? Is it a ...

E5. And do you own or rent your current residence?

E7. Do you have anyone in your household, of any age, who would be dependent on you in an emergency such as a flood?

Base: Lives in a house (Inside Flood Zone n=308; Outside Flood Zone n=355)

A10. Has your basement ever flooded for any reason?

↑ Significantly higher than Outside Flood Zone

↓ Significantly lower than Outside Flood Zone

Demographics

Gender (E9)

	Inside Flood Zone	Outside Flood Zone
Male	52%	50%
Female	48%	50%
Other	0%	0%
Prefer not to answer	0%	0%

Age (Int1)

	Inside Flood Zone	Outside Flood Zone
18 to 24	3%↓	8%
25 to 34	19%	18%
35 to 44	42%↑	26%
45 to 54	8%↓	17%
55 to 64	16%	16%
65+	12%	15%
Prefer not to answer	0%	0%

Household Income (E8)

	Inside Flood Zone	Outside Flood Zone
Less than \$30,000	7%	9%
\$30,000 to just under \$45,000	7%	8%
\$45,000 to just under \$60,000	7%	10%
\$60,000 to just under \$75,000	9%	10%
\$75,000 to just under \$90,000	11%	7%
\$90,000 to just under \$105,000	4%	7%
\$105,000 to just under \$120,000	6%	8%
\$120,000 to just under \$135,000	4%	4%
\$135,000 to just under \$150,000	5%	5%
\$150,000 and over	29%↑	17%
Don't know	2%	3%
Prefer not to answer	8%	11%

Base: All respondents (Inside Flood Zone n=401; Outside Flood Zone n=402)

E9. What is your gender?

Int1. Which of the following age categories do you fall into?

E8. Which of the following categories best describes your total household income in 2018 before taxes? Is it ...

↑ Significantly higher than Outside Flood Zone

↓ Significantly lower than Outside Flood Zone

Quadrant and Flood Impact

Quadrant

	1:100 Flood Zone	1:200 Flood Zone
Southwest	57%	65%
Southeast	12%	12%
Northwest	28%	21%
Northeast	2%	2%

Live in Calgary during 2013 Flood (A4)

	1:100 Flood Zone	1:200 Flood Zone
Yes	91%↑	76%
No	9%↓	24%
Don't know	0%	0%

Did your residence get flooded? (A5)

	1:100 Flood Zone	1:200 Flood Zone
Yes	52%↑	17%
No	48%↓	83%
Don't know	0%	0%

Impact of 2013 Flood (A6)

	1:100 Flood Zone	1:200 Flood Zone
Emotional or psychological stress	54%	35%
Evacuation from your residence	78%↑	41%
Financial burden or stress	43%	23%
Health impacts or injury	11%	2%
Loss of important personal belongings	34%↑	7%
Property damage	42%↑	8%
Disruption to work, school, or daycare	61%	48%
Disruption to commuting routes or recreation	66%	70%
Anything else	6%	2%
None of the above	8%	15%
Don't know	0%	0%

Base: All respondents (1:100 n=300; 1:200 n=101)

A4. Did you live in Calgary during the 2013 flood?

Base: Lived in Calgary during 2013 flood (1:100 n=293; 1:200 n=96)

A5. Did the residence you lived in at the time of the flood get flooded?

A6. Did you experience any of the following as a result of the 2013 flood?

↑ Significantly higher than 1:200

↓ Significantly lower than 1:200

Type of Home (E4)

	1:100 Flood Zone	1:200 Flood Zone
Single, detached house	56%	34%
Duplex, triplex, or fourplex	7%	2%
Townhouse or rowhouse	4%	1%
Apartment or apartment-style condominium	32%↓	62%
Another type of multi-unit complex	0%	1%
Prefer not to say	0%	0%

Own or Rent (E5)

	1:100 Flood Zone	1:200 Flood Zone
Own	69%	67%
Rent	31%	33%
Other	0%	0%
Prefer not to say	0%	0%

Basement ever flooded? (A10)

	1:100 Flood Zone	1:200 Flood Zone
Yes	70%	51%
No	30%	49%
Don't know	0%	0%
Not applicable	0%	0%

Have dependents? (E7)

	1:100 Flood Zone	1:200 Flood Zone
Yes	35%	27%
No	65%	73%
Prefer not to answer	0%	0%

Base: All respondents (Inside Flood Zone n=300; Outside Flood Zone n=101)

E4. What type of home do you live in? Is it a ...

E5. And do you own or rent your current residence?

E7. Do you have anyone in your household, of any age, who would be dependent on you in an emergency such as a flood?

Base: Lives in a house(1:100 n=255; 1:200 n=53)

A10. Has your basement ever flooded for any reason?

↑ Significantly higher than 1:200

↓ Significantly lower than 1:200

Gender (E9)

	1:100 Flood Zone	1:200 Flood Zone
Male	54%	43%
Female	46%	57%
Other	0%	0%
Prefer not to answer	0%	0%

Age (Int1)

	1:100 Flood Zone	1:200 Flood Zone
18 to 24	4%	0%
25 to 34	16%↓	31%
35 to 44	47%↑	23%
45 to 54	7%	10%
55 to 64	15%	20%
65+	12%	16%
Prefer not to answer	0%	0%

Household Income (E8)

	1:100 Flood Zone	1:200 Flood Zone
Less than \$30,000	6%	15%
\$30,000 to just under \$45,000	8%	4%
\$45,000 to just under \$60,000	6%	11%
\$60,000 to just under \$75,000	10%	4%
\$75,000 to just under \$90,000	12%	10%
\$90,000 to just under \$105,000	4%	3%
\$105,000 to just under \$120,000	7%	3%
\$120,000 to just under \$135,000	5%	1%
\$135,000 to just under \$150,000	1%↓	23%
\$150,000 and over	33%↑	12%
Don't know	3%	0%
Prefer not to answer	6%	14%

Base: All respondents (1:100 n=300; 1:200 n=101)

E9. What is your gender?

Int1. Which of the following age categories do you fall into?

E8. Which of the following categories best describes your total household income in 2018 before taxes? Is it ...

↑ Significantly higher than 1:200

↓ Significantly lower than 1:200