



Problem definition in nudge design

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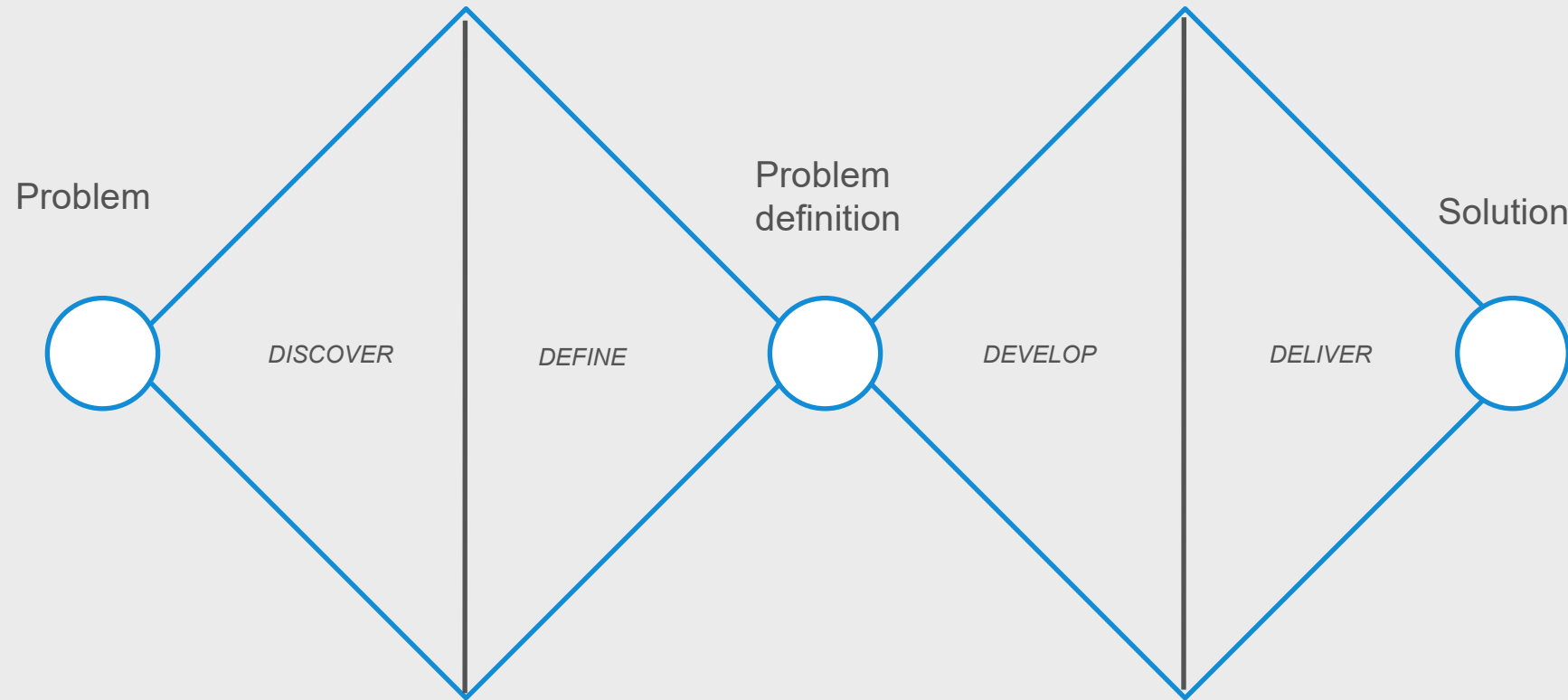
TABLE 4-1 Intervention Strategies Mapped to the Five Foundational Principles

Strategies	Foundational Principle and Everyday Meaning				
	Limited Attention and Cognition	Inaccurate Beliefs	Present Bias	Reference Dependence and Framing	Social Preferences and Social Norms
	"I don't know what I want"	"I think I know what I want"	"I want it now"	"I want this more than I want that"	"I want to do what others are doing"
Altruism Primes			X		X
Behaviorally Informed Incentives, Including Microincentives	X		X	X	
Choice Sets and Active Choice	X	X		X	
Commitment Devices			X		
Defaults	X		X	X	
Feedback	X			X	X
Foot-in-the-Door			X	X	
Framing	X	X		X	
Fresh Start Effects			X	X	
Hassle Factors		X	X		X
Implementation Intentions			X		
Mental Models		X	X	X	
Planning Prompts			X		
Reciprocity Primes					X
Reminders	X		X		
Salience Primes	X				
Scarcity	X		X	X	
Simplification	X		X	X	
Slack	X				
Social Influence	X	X		X	X
Social Proof	X	X	X	X	X
Switching Costs			X	X	
Temptation Bundling			X		

Behavioral economics offers many potential solutions.

How do we learn what works best for the context we're designing for?

Problem definition starts by going to people closest to the problem.



Double Diamond Framework

Case study

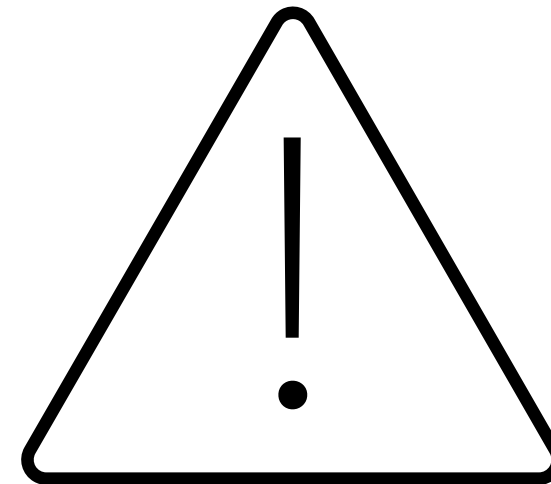
Distributing firearm safe storage devices

Pennsylvania Hospital, Philadelphia

Unintentional firearm injuries have dire consequences for Philadelphians' health.

- Firearm injuries are leading cause of death of children in both U.S. and Philadelphia.
- **40%** of Philadelphians live in a household with at least one firearm. Of those, **2/3** have at least one firearm that's unlocked or unsecured.¹⁻³
- Safe storage devices are evidenced-based strategies to prevent accidents, suicide, intimate partner violence, theft, and violent crime.

Why aren't more firearm owners using safe storage devices?



1. Pew Research 2021.
 2. Betz ME, Stanley IH, Buck-Atkinson J, et al. 2023
 3. Crifasi, Doucette, McGinty et al. 2018

Nudge Unit partnership has distributed 300+ cable firearm locks.

- 2021: Weapon screening starts at Pennsylvania Hospital. Hospital security offers firearm owners option to store weapon during visit, then returns it when they leave.
- 2022: Nudge Unit saw opportunity to reach firearm owners and layer onto **existing workflow**.
 - When security guard returns firearm to owner at end of visit, they are offered a **cable lock** and **brochure**.
- There's been a **44% acceptance rate**, distributing >300 cable gun locks into the local community.
- However, **over half are declining a lock** and we don't know if it's being used at home.



Who is *closest* to the problem?

- Learning goals:
 - Improve program, scale to other locations.
 - Learn ways to measure usage of safety devices.
- Participants:
 - Hospital security guards are people in organization closest to problem of firearms entering hospital.
 - Lived experience with firearm owners, storing 4 weapons / day on average.
 - Could interview firearm owners but unable due to safety risks, recruitment challenges.
- Method: In-depth interviews with 12 security guards.
- Thematic analysis: Reviewed transcripts, double coded in Nvivo, code themes summarized.



Security guards viewed education as main challenge in safe firearm storage.

Education emerged as a major theme in a variety of lenses:

- Security guards view themselves as educators.
- Firearm owners lacked knowledge of basic safety measures.
 - Ex. *“Treat all gun as if they are loaded.”*
- Firearms owners asked guards for instructions on how to use safe storage device.
- Potential exist for additional educational opportunities.

“When giving a lock and literature, I ran into a couple of patients that didn't have a clue on how to get the magazine out, but they were still carrying it. So, I think it just should be pursuing past the gun locks.”

- Participant #8

Security guards believe unsafe storage is due to unlock time.

- **Using cable lock takes extra time.** If someone owns weapon for self-protection, adding extra time to unlocks it goes against their motivation for owning it.
- **Lack of awareness on accidental firearm injuries.** Security guards believe there's lack of awareness on how to prevent accidental firearm injuries. Potential bias can lead people to underestimate risks of accidents.
- **Potential present and availability biases.** Firearm owners may have difficulty taking steps to help their future self while a story of a home invasion may make them inflate personal safety risks.

“It’s all about timing when your life is in great danger... I believe it can help for the safety of yourself but the reality of it is you’re not gonna have time to unlock.”

- Participant #12

Reframing findings helps us identify opportunities.

Findings

- Security guards view themselves as educators.
- Firearm owners look to security guards for instruction AND lack knowledge of safety measures.
- Perception that cable lock prevents a quick response to threat.
- Firearms owners don't want someone know their identity.



How Might We (HMW) Statements

Guide security with evidence-based ways to deliver safe storage device and materials.

Create clear, engaging ways to educate firearms owners on safe storage.

Safely store firearms that can be accessed quickly.

Collect feedback from firearm owners anonymously and quickly.

Participatory design workshop combined hospital leadership with security guards to improve program and co-create new interventions.



Talking points help security guards have conversations about safe storage practices with firearm owners.

BEHAVIORAL SCIENCE FRAMING

FRAMING TONE AS “OLDER SIBLING” PROTECTIVE MESSAGING

Frame the communication as a protective family unit. This approach fosters a sense of community and responsibility, reinforcing the idea that responsible firearm ownership contributes to the safety and well-being of everyone.

EXAMPLE:

- *"I am trying to make sure you get home to your family safe and sound"*
- *"We want to make sure you get home safe and stay safe"*

SOCIAL NORMS AND PEER INFLUENCE

Highlight social norms by indicating that many firearm owners practice safe storage. Encourage responsible behavior by emphasizing that it is a common practice among peers, creating a positive peer influence to adopt safer gun storage practices.

EXAMPLE:

- *"A lot of our visitors store their guns safely to protect themselves."*

EMOTIONAL IMPACT FOR BEHAVIORAL CHANGE

Highlight the emotional consequences of unsafe firearm practices, such as the devastating impact of delivering news about a fatality. Appeal to emotions as a motivator for behavioral change, emphasizing the importance of responsible gun ownership to avoid such tragic outcomes.

EXAMPLE:

- *"The worst feeling in the world is telling someone that their family member was fatally shot."*

EMPHASIS ON CONNECTION OVER CONTENT

Prioritize building connections over-delivering information. Focus on establishing rapport and trust, recognizing that the effectiveness of the safety message lies in the relationship between the communicator and the audience.

EXAMPLE:

- *"Did you know that unsecured firearms pose a significant risk, especially when it comes to accidents involving children?"*
- *"In our work, we see the impact that gunshot injuries have on patients and families..."*

BEFORE: Old brochure included opaque family images, obscuring focus on initiative, included firearms uncommon in urban settings.

WHAT IS PENN MEDICINE DOING?

- Penn Medicine provides support for responsible firearm ownership.
- We have **free cable locks** available for you to take home when you collect your firearm.



SCAN THE QR CODE FOR MORE INFO ABOUT:

- How to use cable locks
- Where to find free firearm locks
- Different firearm storage options
- How to talk with kids about firearm safety
- How to talk to other adults about firearm safety
- Resources about suicide and violence prevention
- ...and more



SECURE FIREARM STORAGE

Penn Medicine Wants to Keep You and Your Family Safe



WHY SHOULD I CARE ABOUT FIREARM STORAGE?

- When you have a firearm, it's important to think about keeping the firearm safe from other people.
- When someone other than the owner gets hold of a firearm, injuries and accidents can occur.
 - Firearm injuries are the **#1 leading cause of death** for kids and teens in the United States.
 - More than 120 people suffer accidental firearm injuries every day in the US.
 - **More than half** of suicide deaths use firearms. Only 1 out of every 10 people who attempt suicide with a firearm survive.
- If you have children, it will be good to think about safe firearm storage.
- Many parents think their children don't know they have firearms, or how to get to them. But **studies show that children do know where firearms are kept**. Some have even touched the firearm without their parents' knowledge.



HOW TO USE THE CABLE LOCK:

First, be sure the firearm is **completely UNLOADED** and the **safety is on SAFE**. When putting on the lock, keep your finger off the trigger and always have the firearm pointing in a safe direction.



PISTOLS



Lock the slide back & take out the magazine, then put the cable through the ejection port & out the magazine well. Put the loose cable into padlock and turn the key to lock.

RIFLES



Open the action (lock it open if you can) & take out the magazine, then put the cable through the ejection port & out the magazine well. Put the loose cable into padlock and turn the key to lock.

REVOLVERS



Open the cylinder, then put the cable through the barrel, or through an empty cylinder chamber. Place the loose cable into padlock and turn the key to lock.

SHOTGUNS



Lock open the bolt, then put the cable through the ejection port and out the loading port. Put the loose cable into padlock and turn the key to lock.

HOW SECURE STORAGE CAN HELP:

- **Injuries and deaths** can be prevented when firearms are stored safely.
- Safely storing firearms can also help **prevent theft and crime**.
- People who come into your home may not know how to use a firearm safely. It is important to keep them away from your firearms. This can keep your family and community safe.
- Sometimes people think of **hurting themselves or someone else**, it is dangerous for them to be near a firearm. Safely storing your firearm could save their life.

AFTER: New brochure is direct about subject, includes instructions for using cable lock, and highlights risks of unsecured firearms with infographics.

RISKS OF AN UNSECURED GUN
When a gun falls into the hands of someone other than the owner, accidents and injuries can happen.

 Gun injuries are the **#1 cause of death** for kids and teens in the US.

 **120 people** suffer accidental gun injuries every day in the US.

9 in 10 who attempt suicide with a gun die.



 **IN DISTRESS?**
Text **HOME** to 741741 for support from a live Crisis Counselor.



SURVEY PARTICIPATION
3-question survey: Earn \$10 + \$20 for follow-up responses

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SECURE GUN STORAGE



Discover how you can protect your family and others

GET A FREE GUN SAFETY DEVICE!

Penn Medicine

PY24-0090 328

WHAT ARE WE DOING AT PENN MEDICINE? We are empowering gun owners to choose secure storage for gun safety.

GET A FREE GUN SAFETY DEVICE



SCAN and complete the 3 minute survey to receive yours:

- 1 Open your phone camera
- 2 Scan the QR Code
- 3 Enter your information
- 4 Receive your gun safety device in the mail

SAFETY DEVICE OPTIONS

FREE LOCKS
We offer free cable locks to bring home after a hospital visit.



ALTERNATIVE OPTIONS
Check out projectchildsafe.org for gun safes and lockboxes.

Terms and conditions apply. Offer valid while supplies last.

A STEP-BY-STEP GUIDE ON HOW TO USE THE CABLE LOCK

- 1 Ensure the gun is completely **UNLOADED** and safety is engaged (ON SAFE).
- 2 Unlock cable lock. Keep your finger off the trigger and point the gun in a safe direction.
- 3 Thread cable through empty magazine slot.
- 4 Connect the cable lock and lock it with a key.
- 5 Bring the cable out of the ejection port of the gun.



SCAN FOR VIDEO INSTRUCTIONS

GUN SAFETY TIPS
As responsible gun owners, we all play a crucial role in preventing accidental injury.

- Treat all guns as if they are loaded.
- Always keep your finger off the trigger until you've decided to fire.
- Never point a gun at anything you're not willing to shoot.

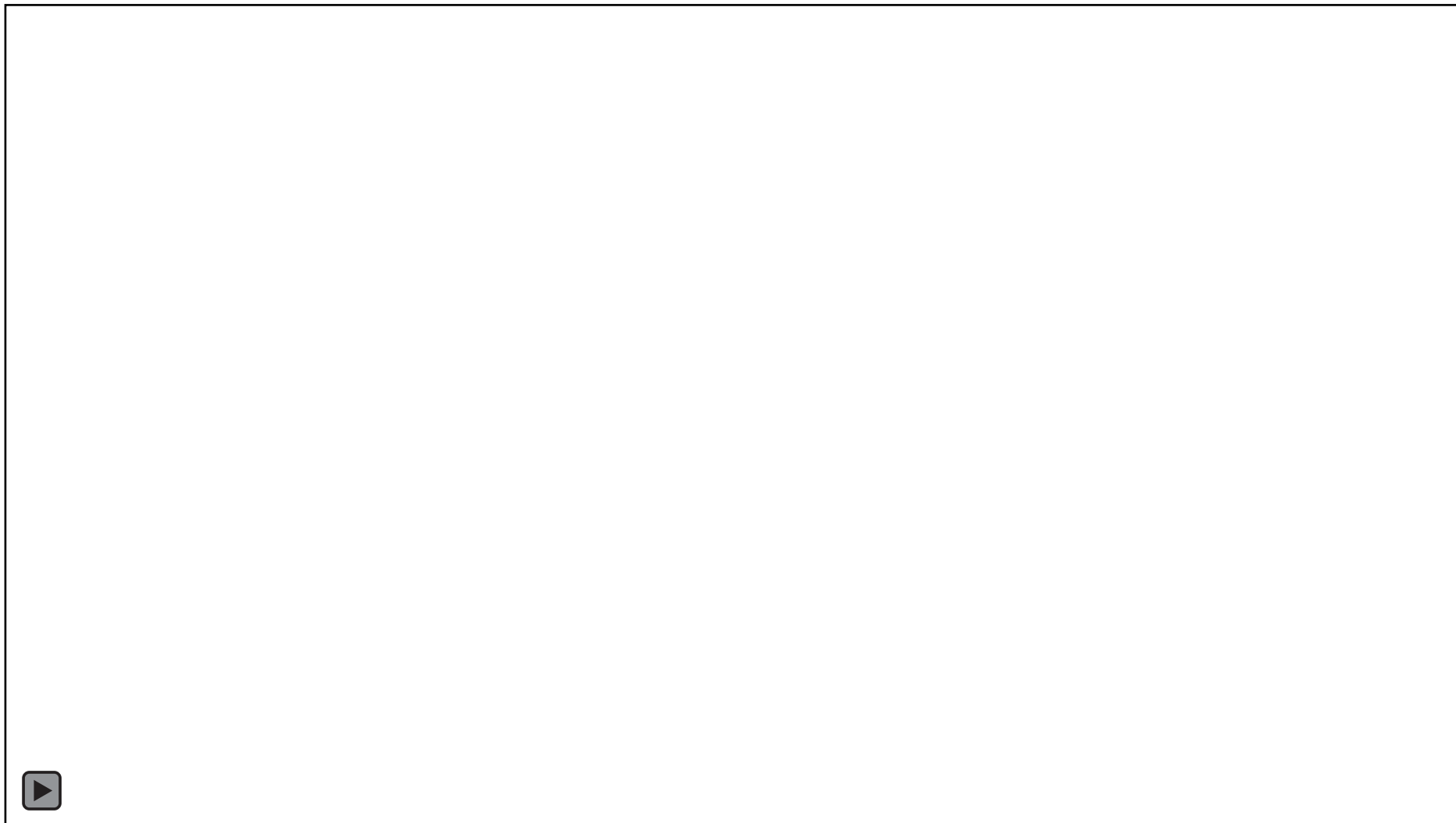
SECURE STORAGE FOR SAFETY
Locking your gun can prevent self-harm, intentional misuse, and accidental injuries. It also deters theft. Each year, hundreds of hospital visitors choose safety and take home a cable lock.

KEEP CHILDREN SAFE

- 3 in 4 children know where to find a gun.
- 1 in 3 have touched a gun without their parent's knowledge.



Distributing lock boxes may help address the challenge of quick access to a firearm.



Pivots ahead!

- **Major policy change.** Can no longer store weapons onsite.
- **Stakeholder support.** Security team will distribute locks at weapon screening.
- **Funding for lockboxes.** Grants from Accelerate Health Equity and PA Dept. of Health.
- **Experimenting with different strategies:**
 - *Security team engagement:* weapon identified at metal detectors, security guard offers lock/brochure. Brochure has unique QR code for survey on usage.
 - *Standalone poster:* poster near entrance with unique QR code offers anonymous way to engage (take survey and get gun lock shipped)

GET A FREE GUN SAFETY DEVICE

PENN MEDICINE ENCOURAGES SECURE GUN STORAGE

We offer free safety devices shipped to your address after your hospital visit. Discover how you can protect your family and others.



SCAN and complete the 3 minute survey to receive yours:

- 1 Open your phone camera
- 2 Scan the QR Code
- 3 Enter your information
- 4 Receive your gun safety device in the mail



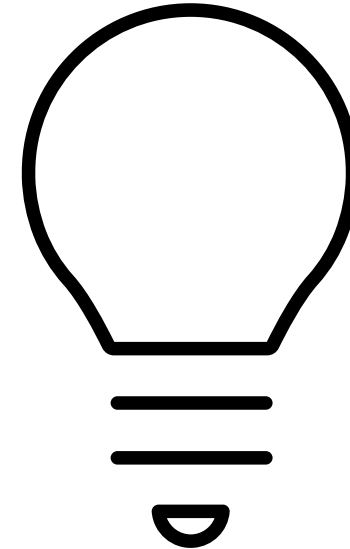



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Principles for human-centered nudge design

- **Start with people closest to the problem.** Hearing directly from people with lived experience is critical to accurate problem definition.
- **Reframe the problem.** Even negative findings can be reframed as brainstorming prompts to guide nudge design.
- **Co-create when designing.** Look for opportunities to actively engage people with lived experience. This helps de-risk your nudge.
- **Build in feedback loops.** Get feedback on early interventions to further de-risk your nudge and incorporate iterative learnings.



Thanks!