

Supplementary Materials Section 1: IT requirements

The following document outlines the IT requirements for developing the experiment as an online survey, including participant quotas, survey questions and response formats, algorithms for calculating and presenting the CVD risk results, and examples of text and graphical formats. Figure S1.1 displays the full study design and Figure S2.2 displays examples of the graphical risk formats.

General Description

This online survey involves 5 stages: 1) pre-intervention questions, 2) CVD risk assessment, 3) results presented in randomised format, 4) post-intervention questions, and 5) follow-up questions after 2 weeks. Pre-intervention questions will be used to identify 600 eligible participants with stratified gender and age categories. Responses for age, gender, diabetes, smoking, blood pressure and cholesterol will be used to calculate each participant's CVD risk using existing algorithms to estimate percentage risk, ideal percentage risk, and heart age. Average values by age and gender will be used if blood pressure or cholesterol levels are unknown. Participants will be randomised to receive their results in different CVD risk formats: percentage risk (text; text + bar graph; text + projected risk graph) or heart age (text; text + bar graph; text + projected risk graph). Further questions will be completed post-intervention and at 2 week follow-up.

[Insert FigureS11]

Randomisation conditions

- 1=percentage, text
- 2=percentage, text and bar graph
- 3=percentage, text and projected risk graph
- 4=heart age, text
- 5= heart age, text and bar graph
- 6= heart age, text and projected risk graph

Stage 1: Pre-intervention questionnaire

All responses need to be recorded in a secure online database that can be downloaded in Excel format with a password required for access. Potential participants will complete the screening questions, and the final 600 participants will be selected based on:

- Criterion 1: Within 45-64 age range (Q2)
- Criterion 2: Answered no to exclusion questions (Q3-6)
- Criterion 3: Main language English or answered never/sometimes to Q8b
- Criterion 4: Quota sampling - need equal numbers of male/female and 5 year age groups (Q1-2). Stop allocating participants in each category once maximum number reached:
 - Male, 45-49=75
 - Male, 50-54=75
 - Male, 55-59=75
 - Male, 60-64=75
 - Female, 45-49=75
 - Female, 50-54=75
 - Female, 55-59=75
 - Female, 60-64=75

Page 1 of 12: About this study (PIS and consent)

Show Participant Information Sheet and consent button.

Page 2 of 12: About you (screening questions)

Show text: In this section we will ask some questions about you to determine whether the study is suitable for you or not.

Q1. What is your gender? (male=1, female=2) *Assign as GENDER variable*

Q2. What is your age? (open numerical response) *Assign as AGE variable*

Q3. Are you currently taking cholesterol lowering medication? (no=1 yes=2)

Q4. Are you currently taking blood pressure lowering medication? (no=1 yes=2)

Q5. Have you been diagnosed with diabetes? (no=1 yes=2)

Q6. Do any of the following apply to you? (no=1 yes=2; NVDPA 2009)

- I have had a heart attack, stroke or bypass surgery
- I have moderate or severe chronic kidney disease (persistent proteinuria or estimated glomerular filtration rate < 45 mL/min/1.73 m²)
- I have been diagnosed with familial hypercholesterolaemia
- My systolic blood pressure (the larger blood pressure number) is higher than or equal to 180 mmHg

- My diastolic blood pressure (the smaller blood pressure number) is higher than or equal to 110 mmHg
- My serum total cholesterol is higher than 7.5 mmol/L

Q7. Are you of Aboriginal or Torres Strait Islander Origin? (no=1 yes=2)

Q8. Language

a) What is the main language you speak at home? (English, other-specify)

If other:

b) When you're reading health-related information in English, how often do you find that you need someone to help you read it? (never, sometimes, often, always]

Compare responses to criteria, record whether each person is a participant or non-participant and redirect to appropriate link. Randomise participants to one of the six conditions with balanced gender and age categories (if possible).

Non-Participants

Show text and button to close window: This study aims to cover the views of a wide range of people, and we have reached the maximum number of people with your characteristics based on your responses. Thank you for your time.

Page 3 of 12: Numerical information

Show text: In this section we will ask some questions about your preferences regarding numerical information.

Q9. Subjective numeracy scale (SNS, Fagerlin 2007)

- a) How good are you at working with fractions?
 b) How good are you at working with percentages?
 c) How good are you at calculating a 15% tip?
 d) How good are you at figuring out how much a shirt will cost if it is 25% off?
 (1=not at all good, 6=extremely good)
- e) When reading the newspaper, how helpful do you find tables and graphs that are parts of a story? (1=not at all, 6=extremely)
- f) When people tell you the chance of something happening, do you prefer that they use words ("it rarely happens") or numbers ("there's a 1% chance")? (1=always prefer words, 6=always prefer numbers)
- g) When you hear a weather forecast, do you prefer predictions using percentages (e.g., "there will be a 20% chance of rain today") or predictions using only words (e.g., "there is a small chance of rain today")?

(1=always prefer percentages, 6=always prefer words; reverse coded)

h) How often do you find numerical information to be useful?
(1=never, 6=very often)

Page 4 of 12: Blood pressure & cholesterol

Show text: In this section we will ask some questions about your blood pressure and cholesterol levels.

Q10. Blood pressure

- a) What is your systolic blood pressure - the larger blood pressure number?
(numerical response, or don't know=999)
- b) What is your diastolic blood pressure level - the smaller blood pressure number?
(numerical response, or don't know=999)
- c) Has a health professional said you have raised blood pressure? (no=1 yes=2)
- d) Has a health professional assessed your blood pressure in the last year? (no=1 yes=2)

*If systolic blood pressure provided, assign as SBP.
Use average systolic blood pressure for AGE and GENDER if unknown.
Add one standard deviation if told they have raised blood pressure.*

Q11. Cholesterol

- a) What is your total cholesterol level - sometimes referred to as 'bad' cholesterol?
(numerical response, or don't know=999)
- b) What is your HDL cholesterol level - sometimes referred to as 'good' cholesterol?
(numerical response, or don't know=999)
- c) Has a health professional said you have raised cholesterol? (no=1 yes=2)
- d) Has a health professional assessed your cholesterol in the last year? (no=1 yes=2)

*If total cholesterol provided, assign as TOTALC.
If HDL cholesterol provided, assign as HDLC.
Use average values for AGE and GENDER if unknown.
Add one standard deviation to average total cholesterol if told they have raised cholesterol.
Calculate CRATIO variable=TOTALC/HDLC.*

Page 5 of 12: Your lifestyle

Show text: In this section we will ask some questions about your lifestyle.

Q12. Smoking

a) Do you currently smoke cigarettes? (no=1 yes=2) *Assign as SMOKE variable.*

Show if yes:

b) In the last week, how many cigarettes did you usually smoke per day? (open numerical response)

Q13. Physical activity (time scale added to validated 2Q-PA scale, Smith 2005)

a) In the last week, how many times did you do 20 minutes or more of vigorous-intensity physical activity that made you sweat or puff and pant? (e.g. heavy lifting, digging, jogging, aerobics, or fast bicycling). Scale 0 / 1 / 2 / 3 / 4 / 5+

b) In the last week, how many times did you do 30 minutes or more of moderate-intensity physical activity or walking that increased your heart rate or makes you breathe harder than normal? (e.g. carrying light loads, bicycling at a regular pace, or doubles tennis). Scale 0 / 1 / 2 / 3 / 4 / 5+

Q14. Diet (O'Hara 2012; NHMRC 2003: www.gofor2and5.com.au/whatisaserve)

a) In the last week, how many serves of fruit did you usually eat per day? (e.g. 1 apple, 2 apricots, 1 cup chopped fruit). Scale 0 / 1 / 2 / 3 / 4 / 5+

b) In the last week, how many serves of vegetables did you usually eat per day? (e.g. ½ cup cooked vegetables, 1 medium potato, 1 cup salad). Scale 0 / 1 / 2 / 3 / 4 / 5+

Q15. What is your height?

a) open numerical response in cm OR

b) open numerical response in feet and inches

Q16. What is your current weight?

a) open numerical response in kg OR

b) open numerical response in pounds

Page 6 of 12: Your perceptions of risk

Show text: In this section we will ask some questions about your perceptions of risk.

Q17. Your risk (Dillard 2012)

a) If I don't change my lifestyle, I think my chance of having a heart attack or stroke in the next 5 years is: scale 0% to 100% in increments of 10%.

b) If I don't change my lifestyle, I think my chance of having a heart attack or stroke in the next 5 years is: 7-point scale ranging from "almost zero" to "almost certain."

c) If I don't change my lifestyle, I would feel very vulnerable to having a heart attack or stroke in the next 5 years: 7-point scale ranging from "strongly disagree" to "strongly agree"

d) Compared to the average for my age and gender, my chance of having a heart attack or stroke in the next 5 years is: 7-point scale ranging from "Much lower" to "Much higher" with a midpoint of "About the same."

Q18. Worry (Lee 2011)

a) To what extent are you worried about heart attack and stroke?

b) To what extent does thinking about heart attack and stroke bother you?
(not at all=0 to extremely=10)

Stage 2: Risk assessment

See steps 1-4 at the end of the Wells paper for 5 year risk algorithms. We will not be using the 5% adjustment for family history and ethnicity used in the Wells paper, just the basic calculation.

Calculate and record PERCENT - this refers to their 5 year percentage CVD risk.

Calculate and record IDEALP - this refers to what the 5 year percentage risk would be if they didn't smoke, had low systolic blood pressure and low cholesterol ratio (SMOKE=1, SBP=120, CRATIO=4)

Calculate and record HEARTAGE - this refers to the age at which they would reach PERCENT if SMOKE=1, SBP=120, CRATIO=4. If greater than 100 then set variable HEARTAGE to 100 for risk presentation and record this as 1 in HEARTAGE_100 column, i.e. the maximum heart age they can be told is 100, even if it's estimated to be higher than that.

Stage 3: Randomised risk formats

The participant's randomisation determines the CVD risk format that their results will be presented in:

- 1=percentage, text
- 2=percentage, text and bar graph
- 3=percentage, text and projected risk graph
- 4=heart age, text
- 5= heart age, text and bar graph
- 6= heart age, text and projected risk graph

The section below outlines how the results should be displayed. The text should be shown above the graph on the same page for those randomised to receive a graphical format (randomisation=2,3,5,6).

Page 7 of 12: Your results

Show text: These results are based on your responses to the previous questions.

TEXT FORMATS

If HEARTAGE>AGE and SMOKE=2 and:

Randomisation=1-3 (percentage format):

Your risk of having a heart attack or stroke in the next 5 years is (PERCENT)%. If you stopped smoking and had lower blood pressure and cholesterol, your risk would be (IDEALP)%. You can reduce your blood pressure and cholesterol by quitting smoking, improving your diet and increasing physical activity.

Randomisation=4-6 (heart age format): Your heart age is (HEARTAGE), (HEARTAGE-AGE) years older than you. If you stopped smoking and had lower

blood pressure and cholesterol, your heart age would be (AGE), the same as your current age. You can reduce your blood pressure and cholesterol by quitting smoking, improving your diet and increasing physical activity.

If HEARTAGE>AGE and SMOKE=1 and:

Randomisation=1-3 (percentage format): Your risk of having a heart attack or stroke in the next 5 years is (PERCENT)%. If you had lower blood pressure and cholesterol, your risk would be (IDEALP)%. You can reduce your blood pressure and cholesterol by improving your diet and increasing physical activity.

Randomisation=4-6 (heart age format): Your heart age is (HEARTAGE), (HEARTAGE-AGE) years older than you. If you had lower blood pressure and cholesterol, your heart age would be (AGE), the same as your current age. You can reduce your blood pressure and cholesterol by improving your diet and increasing physical activity.

If HEARTAGE≤AGE and:

Randomisation=1-3 (percentage format): Your risk of having a heart attack or stroke in the next 5 years is (PERCENT)%. Congratulations, this is a good result for your age and gender.

Randomisation=4-6 (heart age format, if heart age=age): Your heart age is (HEARTAGE), the same as your current age. Congratulations, this is a good result for your age and gender.

Randomisation=4-6 (heart age format, if heart age < age): Your heart age is (HEARTAGE), (AGE-HEARTAGE) years younger than you. Congratulations, this is a good result for your age and gender.

GRAPH FORMATS

The algorithms outlined in Stage 2 will be used to create the graphs.

Randomisation=2 (percentage, text + bar graph)

Title = Risk of having a heart attack or stroke in the next 5 years

Y axis=0-50%

X axis=your risk (PERCENT), ideal risk (IDEALP)

Randomisation=5 (heart age, text + bar graph)

Title = Heart age

Y axis=35 to 100

X axis=your heart age (HEARTAGE), ideal heart age (AGE)

Randomisation=3 (percentage, text + projected risk graph)

Title = Risk of having a heart attack or stroke in the next 5 years

Y axis=0-50%

X axis=35 to 100

Blue line=ideal risk (IDEALP)

Red line=your risk (PERCENT),

Randomisation=6 (heart age, text + projected risk graph)

Title = Heart age

Y axis=35 to 100 (heart age)

X axis=35 to 100 (actual age)

Blue line=dot at AGE, with line projected from 35-100

Red line=dot at HEARTAGE, with line projected from AGE-100

[Insert FigureS12]

Stage 4: Post-intervention questionnaire

Page 8 of 12: Your results

Show text: Please answer the following questions regarding the results you just received:

Q19. Relevance ($\alpha=.89$, Scherer 2013)

- a) I felt that the numbers received were "my numbers"
 - b) I found the results to be written personally for me
 - c) I felt that the information was relevant to me
 - d) I felt that the information was designed specifically for me
- (scale 1-7 from strongly disagree to strongly agree)*

Q20. My results made me feel: (positive affect $\alpha=.81$ /negative affect $\alpha=.85$, Catellier 2012)

- a) hopeful
 - b) optimistic
 - c) enthusiastic
 - d) afraid
 - e) anxious
 - f) worried
- (none of this feeling=0 to a lot of this feeling=10)*

Q21. My results indicate:

- Low risk of having a heart attack or stroke*
- Moderate risk of having a heart attack or stroke*
- High risk of having a heart attack or stroke*

Q22. My results indicate that I need to change my lifestyle (7-point scale ranging from "strongly disagree" to "strongly agree")

Q23. What do you think the average result for your age and gender would be?

- a) Randomisation=1-3 (percentage format): *lower than my result, the same as my result, higher than my result*
- b) Randomisation=4-6 (heart age format): *lower than my age, the same as my age, higher than my age*

If lower or higher selected:

- c) Please specify what you think the average result for your age and gender would be (open numerical response)

Page 9 of 12: Your perceptions of risk

Show text: In this section we will ask some questions about your perceptions of risk.

Q24. Your risk (Dillard 2012, differentially predictive of intention)

- a) If I don't change my lifestyle, I think my chance of having a heart attack or stroke

in the next 5 years is: *scale 0% to 100% in increments of 10%.*

b) If I don't change my lifestyle, I think my chance of having a heart attack or stroke in the next 5 years is: *7-point scale ranging from "almost zero" to "almost certain."*

c) If I don't change my lifestyle, I would feel very vulnerable to having a heart attack or stroke in the next 5 years: *7-point scale ranging from "strongly disagree" to "strongly agree"*

d) Compared to the average for my age and gender, my chance of having a heart attack or stroke in the next 5 years is: *7-point scale ranging from "Much lower" to "Much higher" with a midpoint of "About the same."*

Q25. Worry ($r=.73$, Lee 2011)

a) To what extent are you worried about heart attack and stroke?

b) To what extent does thinking about heart attack and stroke bother you?
(*not at all=0 to extremely=10*)

Page 10 of 12: Your perceptions of heart disease

Show text: In this section we will ask some questions about your perceptions of heart disease.

Q26. Timeline (validated AIRR subscale-timeline risk; $\alpha=.89$, Lee 2011)

a) People of my age are likely to develop heart disease at this time in their lives.

0 1 2 3 4 5 6 7 8 9 10 (0=Strongly disagree / 5=Neither agree nor disagree / 10=Strongly agree)

b) How likely is it that a person your age would get heart disease now – at this age:

0 1 2 3 4 5 6 7 8 9 10 (0=No chance / 2-3=Probably will not happen / 5=50–50 chance / 7-8=Probably will happen / 10=Certain to happen)

c) How likely is it that a person of your age would get heart disease in the next 5 years: *0 1 2 3 4 5 6 7 8 9 10 (0=No chance / 2-3=Probably will not happen / 5=50–50 chance / 7-8=Probably will happen / 10=Certain to happen)*

Q27. Control (validated AIRR subscale-personal control; Cameron 2008)

a) There is a lot that I can do to prevent heart disease.

b) What I do will determine whether or not I get heart disease.

c) My actions will have no effect on whether or not I get heart disease.

(*strongly disagree=1, disagree=2, neither agree nor disagree=3, agree=4, strongly agree=5*)

Q28. Understanding (validated AIRR subscale-coherence; $\alpha=.81$, Lee 2011)

a) I have a clear picture or understanding of my risk of heart disease.

b) I don't understand my risk of heart disease.

c) I have a clear picture or understanding of the signs and symptoms of heart disease.

d) I don't know how much I am at risk for heart disease.

(*strongly disagree=1, disagree=2, neither agree nor disagree=3, agree=4, strongly agree=5*)

Page 11 of 12: Your intentions

Show text: In this section we will ask some questions about your intentions regarding your lifestyle.

Only show if SMOKE=2

Q29. Smoking (based on TPB questionnaire development manual)

- a) I expect to smoke less in the next 2 weeks
 - b) I want to smoke less in the next 2 weeks
 - c) I intend to smoke less in the next 2 weeks
- (scale 1-7 from strongly disagree to strongly agree)

Q30. Diet (based on TPB questionnaire development manual)

- a) I expect to improve my diet in the next 2 weeks
 - b) I want to improve my diet in the next 2 weeks
 - c) I intend to improve my diet in the next 2 weeks
- (scale 1-7 from strongly disagree to strongly agree)

Q31. Physical activity (based on TPB questionnaire development manual)

- a) I expect to do more physical activity in the next 2 weeks
 - b) I want to do more physical activity in the next 2 weeks
 - c) I intend to do more physical activity in the next 2 weeks
- (scale 1-7 from strongly disagree to strongly agree)

Q32. Doctor (based on TPB questionnaire development manual)

- a) I expect to discuss my risk of heart disease with a doctor in the next 2 weeks
 - b) I want to discuss my risk of heart disease with a doctor in the next 2 weeks
 - c) I intend to discuss my risk of heart disease with a doctor in the next 2 weeks
- (scale 1-7 from strongly disagree to strongly agree)
-

Page 12 of 12: Recall and thank you

Q33. What was the result you received in this survey?

If randomisation=1-3 (percentage format):

- a) My risk of having a heart attack or stroke in the next 5 years was ____ % (open numerical response or don't know=999)

If randomisation=4-6 (heart age format):

- b) My heart age was ____ (open numerical response or don't know=999)

Once answered, save response, then show 4 links in randomised position order and record first time stamp for each option if clicked (open hyperlinks in new window to allow multiple links to be clicked).

Show text: Thank you for your time, you have finished the first part of the study! We will contact you again in 2 weeks to ask you a few final questions, which will only

take a few minutes. If you have any questions please contact the research coordinator, Carissa Bonner, at carissa.bonner@sydney.edu.au.

Link 1. Click here for more information about heart disease risk
(<http://www.heartfoundation.org.au/your-heart/know-the-risks/Pages/default.aspx>)

Link 2. Click here for more information about having a healthy lifestyle
(<http://www.heartfoundation.org.au/your-heart/how-we-can-help/Pages/health-information-service.aspx>)

Link 3. Click here to go to Google (www.google.com)

Link 4. Click here to close this window (add code)

Stage 5: Follow-up questionnaire

Self-reported behaviour and risk perception assessed at 2 week follow-up.

Page 1 of 4: Introduction

Show text: Reiterate Participant Information Sheet re. follow-up for study.
In the final part of the study, we will ask some questions about your lifestyle and perception of risk. This will only take a few minutes.

Page 2 of 4: Your lifestyle

Q1. Smoking

a) Do you currently smoke cigarettes? (no=1 yes=2)

Show if yes:

b) In the last week, how many cigarettes did you usually smoke per day? (open numerical response)

Q2. Physical activity (time scale added to validated 2Q-PA scale, Smith 2005)

a) In the last week, how many times did you do 20 minutes or more of vigorous-intensity physical activity that made you sweat or puff and pant? (e.g. heavy lifting, digging, jogging, aerobics, or fast bicycling). Scale 0 / 1 / 2 / 3 / 4 / 5+

b) In the last week, how many times did you do 30 minutes or more of moderate-intensity physical activity or walking that increased your heart rate or makes you breathe harder than normal? (e.g. carrying light loads, bicycling at a regular pace, or doubles tennis). Scale 0 / 1 / 2 / 3 / 4 / 5+

Q3. Diet (O'Hara 2012; NHMRC 2003: www.gofor2and5.com.au/whatisaserve)

a) In the last week, how many serves of fruit did you usually eat a day? (e.g. 1 apple, 2 apricots, 1 cup chopped fruit). Scale 0 / 1 / 2 / 3 / 4 / 5+

b) In the last week, how many serves of vegetables did you usually eat a day? (e.g. ½ cup cooked vegetables, 1 medium potato, 1 cup salad). Scale 0 / 1 / 2 / 3 / 4 / 5+

Q4. Doctor

a) Have you discussed your risk of heart disease with a doctor in the last 2 weeks? (including blood pressure, cholesterol or lifestyle change) (no=1 yes=2)

Show if no:

b) Have you made an appointment to discuss your risk of heart disease with a doctor? (including blood pressure, cholesterol or lifestyle change) (no=1 yes=2)

Page 3 of 4: Your perceptions of risk

Q5. Your risk (Dillard 2012, differentially predictive of intention)

a) If I don't change my lifestyle, I think my chance of having a heart attack or stroke in the next 5 years is: scale 0% to 100% in increments of 10%.

b) If I don't change my lifestyle, I think my chance of having a heart attack or stroke in the next 5 years is: 7-point scale ranging from "almost zero" to "almost certain."

c) If I don't change my lifestyle, I would feel very vulnerable to having a heart attack or stroke in the next 5 years: 7-point scale ranging from "strongly disagree" to "strongly agree"

d) Compared to the average for my age and gender, my chance of having a heart attack or stroke in the next 10 years is: 7-point scale ranging from "Much lower" to "Much higher" with a midpoint of "About the same."

Q6. Worry ($r=.73$, Lee 2011)

a) To what extent are you worried about heart attack and stroke?

b) To what extent does thinking about heart attack and stroke bother you?

(not at all=0 to extremely=10)

Page 4 of 4: Recall and thank you

Q7. What was the result you received in the first survey?

If randomisation=1-3 (percentage format):

My risk of having a heart attack or stroke in the next 5 years was ____ % (open numerical response or don't know=999)

If randomisation=4-6 (heart age format):

My heart age was ____ (open numerical response or don't know=999)

Once answered, show text and provide hyperlink to debriefing information:

Thank you for your time, you have finished the study! If you have any questions please contact the research coordinator, Carissa Bonner, at carissa.bonner@sydney.edu.au.

Link to debriefing information.