

EXPERIENCE OF USING TECHNOLOGIES TO SUPPORT FOODBORNE DISEASE INVESTIGATION

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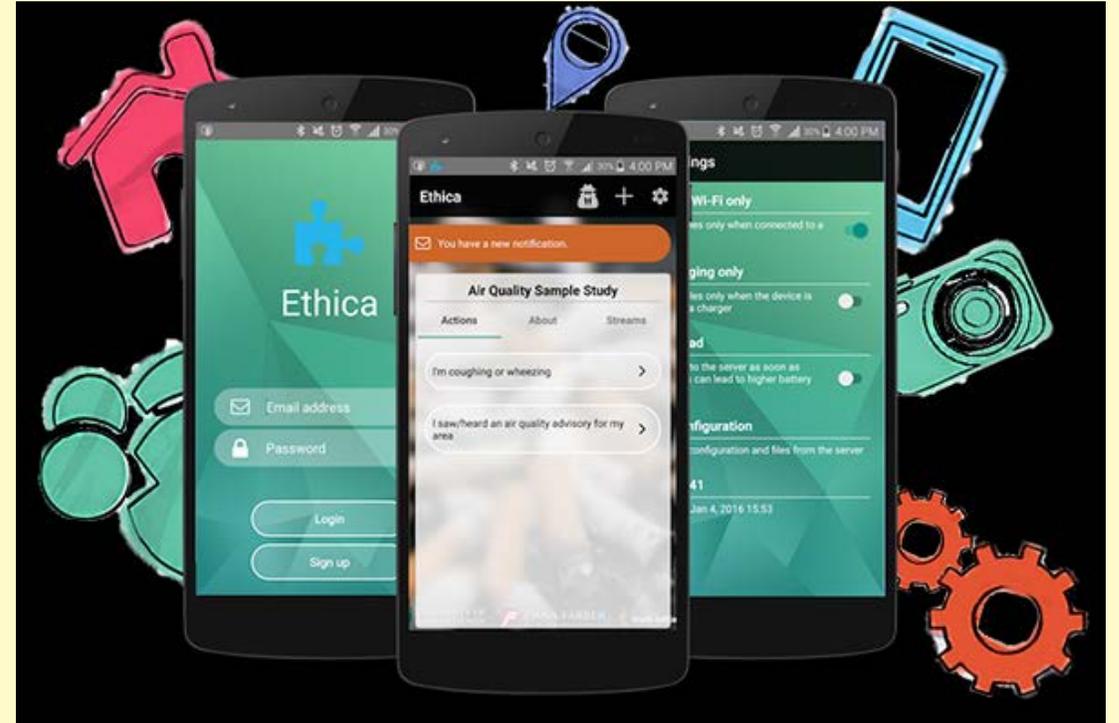
Ethica

Smartphone platform that provides a mobile research lab.

Participants download the app and can join studies while having full control of the data.

Developed at University of Saskatchewan to track the spread of H1N1 in 2009 by Mohammad Hashemaian, Nathaniel Osgood, Kevin Stanley and Amin Tavossolian.

<http://www.ethicadata.ca/>



Exploring New Technologies to Support Investigation of Foodborne Disease

- Funded by the Saskatchewan Health Research Foundation Collaborative Innovation Development Grant
- Gathering data on food consumption and occurrence of gastrointestinal illness to aid the investigation of enteric disease
- Objectives of the proof of concept pilot study:
 - *Measure the extent of participant recall bias – a limitation of traditional investigation strategies*
 - *Determine the utility of the app*
- My part – what was the experience of using this app. Were there challenges to compliance?

Research question

- *Would the iEpi smartphone based-technology improve upon current surveillance methods to recall retrospective food consumption, guide better health outcomes and nudge change in high risk food consumption behaviours?*

Study Registration

New Tech for Foodborne Disease - Demo

 School of Public Health, University of Saskatchewan

 From May 12 to Jul 24, 2016

About the study:
10 week longitudinal study

Your participation would involve using your Android smartphone and the Ethica app originally developed at the University of Saskatchewan to:

- a) take pictures and answer short questions about the food you eat over a 10-day period,
- b) take short (5 min) enrollment and debriefing surveys, and
- c) complete an on-line survey (15-20 min) similar to one used by public health officials investigating food-borne illnesses.

Cancel Register

Methods



- 96 university students recorded food consumption over 10 weeks using a food-reporting button on their phone with location-sensing features, taking a photo, and answering questions
- Provided detailed information via photos, audio, and questions on their daily food choices for the first 10 days of the study
- To cross-validate self-reported eating, randomly triggered surveys inquired if the participant had eaten since the last time they triggered the food-reporting button
- Remainder of the data collection was food consumption choices and random, context-specific short surveys
- If they felt ill, they would self-report, describing symptoms and if they sought out a healthcare provider

Data Collection

- Demographic question (day 2)
- Survey of food purchasing preferences (day 12)
- Survey that is modeled on PHAC Foodbook survey for food-borne illness investigation delivered day 12 or day 23, reflecting either 1 week or 2.5 weeks after the midpoint of intensive monitoring
- Focus groups to debrief the experience

The image shows a mobile application interface for 'Ethica'. At the top, there is a status bar with various icons and the time '7:53 AM'. Below that is a dark header with the word 'Ethica' and a three-dot menu icon. The main content area is a survey form with three sections. The first section asks 'Where is the source of this food?' and has four radio button options: 'Food purchased on campus', 'Ready-to-eat food purchased off campus', 'Eating at restaurant', and 'Eating food prepared at home'. The second section asks 'Please take a photo of the food you are eating.' and features a prominent 'TAKE A PHOTO' button. The third section asks 'Would you like to explain what is this food?' and has two radio button options: 'Text' (which is selected) and 'Audio'. At the bottom of the screen, there is a navigation bar with a 'Previous' button and a 'Submit' button.

Ethica

Where is the source of this food?

Food purchased on campus

Ready-to-eat food purchased off campus

Eating at restaurant

Eating food prepared at home

Please take a photo of the food you are eating.

TAKE A PHOTO

Would you like to explain what is this food?

Text Audio

Previous **Submit**

Focus Group Findings



- App was simple to use, became routine
- Missing a selection for dietary requirements and ethnic foods
- Some found it awkward taking pictures at a restaurant, others would forget and take a picture of an empty plate
- Interested in having access to personal data

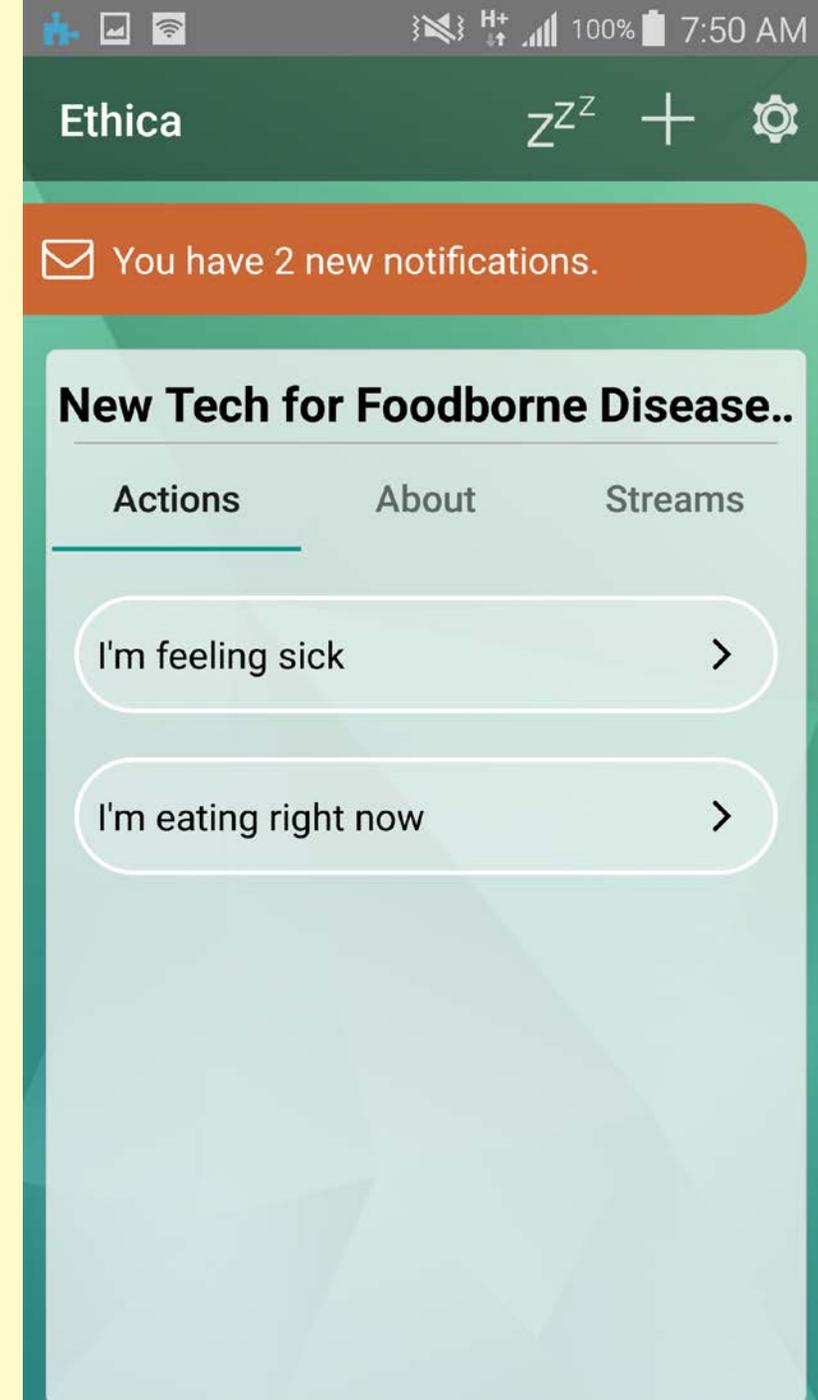
Privacy



- No one seemed to mind that the app was tracking them with GPS, recognizing the phone has that capacity anyway
- Viewed researchers as a trusted source
 - *More comfortable with Ethica than with Google*
- Students had a number of questions regarding their phone settings
 - *We have adopted technology with little understanding of privacy*

Positive Nudges

- Some noticed an improvement in diets
 - *Realized irregular food intake*
 - *“It definitely made me more aware of how awful my diet is.”*
 - *“I reduced carbs, I stopped eating carbs because I was noticing myself every time I was taking pictures.”*
- Increased awareness linking feeling ill to eating
 - *“If I was feeling sluggish or really shitty I would make little notes around that. You could, like, see what you ate a few days before and maybe identify some allergies you have or anything you have. It’s just really interesting in my opinion.”*



Tracking



- Many use tracking apps for personal interest and wanted to see their data over the course of the study
- Suggested using a fitness app in conjunction with food safety
 - *Yeah. It's almost like a cultural thing. People are like getting those Fit Bits and getting those apps they are going to be more diligent at actually using them. But then they are probably healthier; they are probably choosing better foods so it is questionable whether it's useful as far as tracking foodborne illness unless there's a sort of location that has an actual outbreak of a problem right?*

Foodborne Illness

- Is foodborne illness linked to tracking food and lack of consumer knowledge?
 - *“I think people who are really inclined, based on like this new cultural phenomenon of people really wanting to track what they are eating, and being really aware of their food. It is hard to find, sometimes, the information on how to properly prepare some foods, so sometimes people might overcook or undercook food without even realizing they are doing it. So it might be something that, foodborne illness might be, like people are choosing fresher options, people are choosing foods that need to be prepared and handled more carefully but they might not be applying those practices.”*

100% 7:53 AM

Ethica

Did you consult a health-care professional regarding this illness?

Yes

No

Did you suspect your illness might be related to consumption of alcoholic beverages?

Yes

No

I've got ...

Nausea

Vomiting

Diarrhea

Abdominal pain and cramps

Fever

Other

← Previous Submit

Food Safety Awareness



- Micro-survey were mini-education sessions
 - *“And I'm like, I better go and figure that out. Do you need to use a thermometer when you reheat leftovers kind of thing? And I'm like oh, I don't know I just assumed you didn't.”*
- Tracking made people more aware
 - *“I found myself thinking more about what could make me sick, like when I was taking pictures, I was like, I wonder if this is going to make me sick in a few days. (Laughs) A horrible, pessimistic way to think, but I was just thinking more about it, I wasn't necessarily learning more, but thinking more.”*

Conclusions



- The Millennial Generation group - those aged 18 to 34 in 2014, know more about technology than food safety
- They expressed few concerns over privacy, yet know very little about location sensors
- The use of the app provided a nudge toward healthy eating and food safety awareness
- They like to see data about themselves but without the effort of doing data entry
- Analysis on recall bias is currently underway. This group found the Ethica app easy to use, and food tracking can reinforce health eating and safe food preparation.

Thank You

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