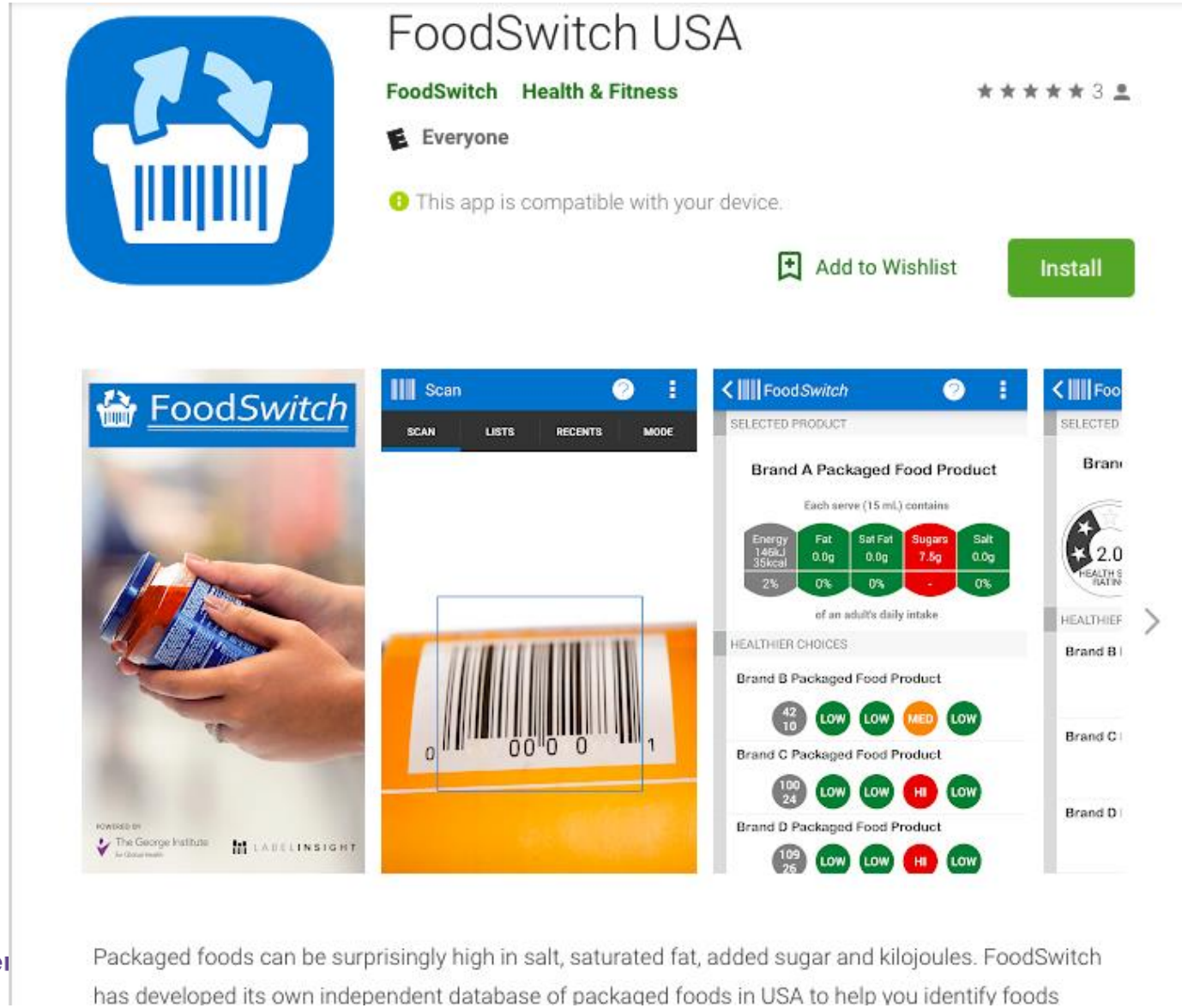
Download FoodSwitch for iOS or Android



Packaged foods can be surprisingly high in salt, saturated fat, added sugar and kilojoules. FoodSwitch has developed its own independent database of packaged foods in USA to help you identify foods

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FoodSwitch: A mobile platform for packaged food surveillance and behavioral research

Mark Huffman, MD, MPH
Department of Preventive Medicine and Medicine-Cardiology
Northwestern University Feinberg School of Medicine
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The George Institute for Global Health

Disclosures

Grants

One Brave Idea: American Heart Association, Verily, AstraZeneca, significant
JR Alberts Foundation, modest
UL1RR025741, via NUCATS, significant

NHLBI R61 HL139852, significant
FIC D43TW010543, significant
NCI CA184211, significant
World Heart Federation, via Boehringer Ingelheim & Novartis, significant
Cochrane Collaboration, significant
Northwestern University Global Health Initiative, significant

Travel

American Heart Association, World Heart Federation

Consultancy, speakers' bureau, advisory board

None

Take Home Points

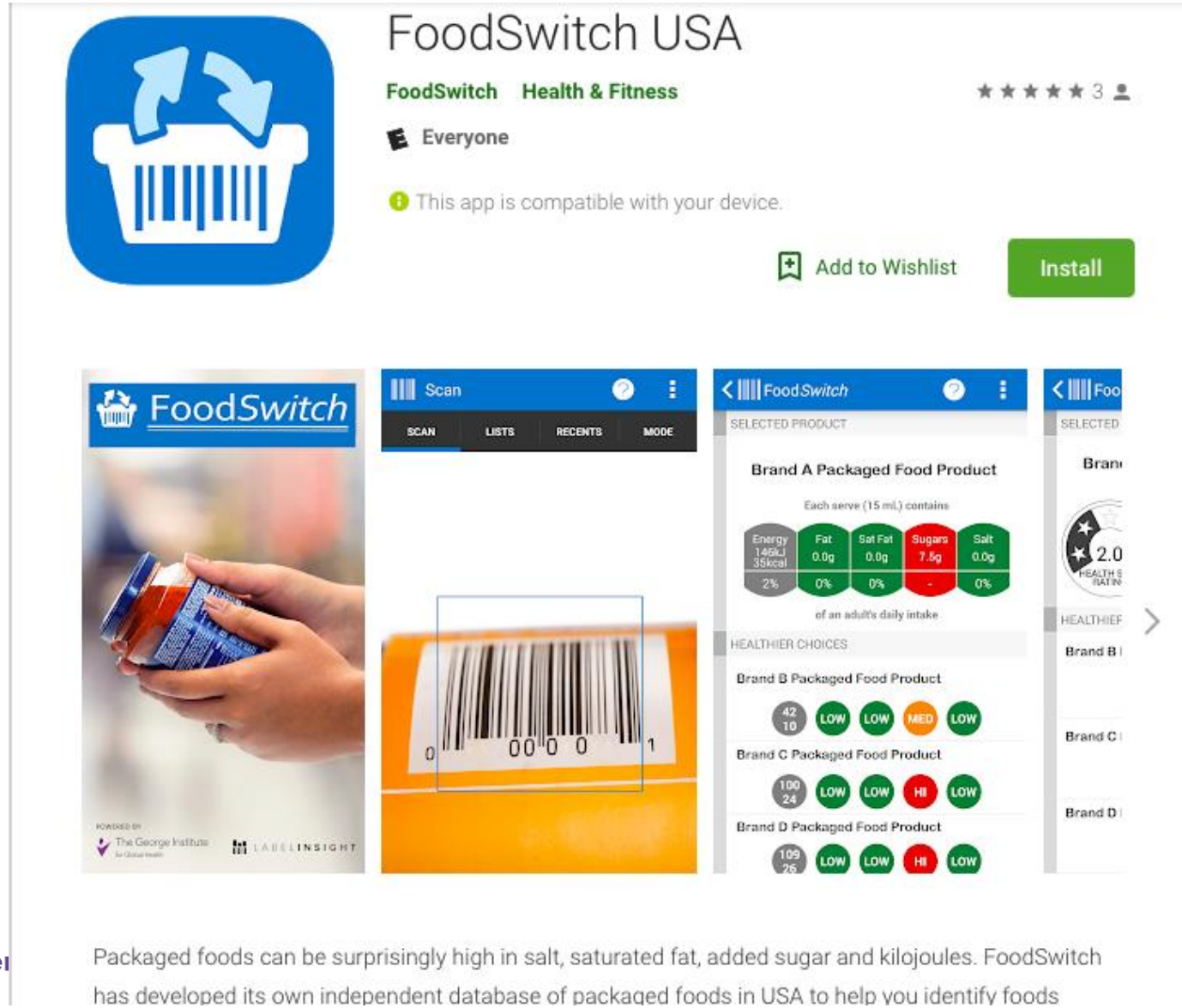
Surveillance of the global packaged food supply is necessary to improve its healthfulness: trans fats and salt are exemplars.

FoodSwitch is a mobile phone app that uses crowdsourcing for packaged food surveillance on a brand-level and is available in the US.

Crowdsourcing is an increasingly prevalent approach for mutual reinforcing activities of generating ideas, data collection, and community engagement.

Mobile- and online-based trials provide opportunities for lower cost, scalable interventions yet require new partnerships for sustainability.

Download FoodSwitch for iOS or Android



Packaged foods can be surprisingly high in salt, saturated fat, added sugar and kilojoules. FoodSwitch has developed its own independent database of packaged foods in USA to help you identify foods

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Background

The US food supply has excessive salt, added sugar, and unhealthy fats that drive chronic diseases and their upstream risk factors.

While dietary guidelines generally recommend diets rich in fresh fruits and vegetables, Americans receive most of their calories through packaged foods.

Most dietary surveillance methods have relied upon self-reporting of dietary intake, which is prone to recall bias.

To understand and improve the healthfulness of the food supply, it is imperative to monitor the food supply at a granular level, yet no such surveillance system has existed until recently.

Example 1: Same brand, same country

Product higher in salt

Sodium per serving: 155mg

65% less salt!

Product lower in salt

Sodium per serving: 55mg

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Example 2: Same product, different countries

Product higher in salt

31% less salt!

Product lower in salt

USA: Sodium per 100g: 720mg

Australia: Sodium per 100g: 550mg

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Example 3: Different brands, same country

Brand higher in salt

Sodium per 100g: 600mg

35% less salt!

Brand lower in salt

Sodium per 100g: 400mg

Saving strokes: Comparison of salt in example adult meals in one day				
Amount of salt in initial choice		Amount using lower salt options		Salt saved
Breakfast				
Kellogg's Special K Forest Berries 45g	0.50	**Kellogg's** Just Right Barley & Berry Flavour 45g	0.05	94% less salty
Total breakfast	***0.50 g***	***Total breakfast***	***0.05 g***	***Save 0.45 g***
Snack				
Arnott's Sao Biscuit 25g	0.50 g	**Ryvita** Multigrain Wholegrain Rye Crispbread 25g	0.20	67% less salty
Kraft Crunchy Peanut Butter 20g	0.30 g	**Coles** Crunchy Peanut Butter No Added Salt 20g	0.06	96% less salty
Total snack	***0.80 g***	***Total snack***	***0.26 g***	***Save 0.50 g***
Lunch				
Wattle Valley Soft Wholegrain Wraps 43g	0.90	**Freedom Foods** Norganic Multigrain Wraps 43g	0.30	71% less salty
Primo Premium Shaved Leg Ham 50g	1.50	**Don** Shaved Light Leg Ham 50g	0.95	38% less salty
Bega Super Cheese Slices 21g	0.80	**Kraft** Liveactive Light Cheese Slices 21 g	0.65	17% less salty
Spring Gully Foods Green Tomato Pickle 20g	0.15	**Beerenberg** Green Tomato Pickle 20g	0.05	65% less salty
Total lunch	***3.35 g***	***Total Lunch***	***1.95 g***	***Save 1.40 g***
Snack				
Coles Fruit Filled Bar (Apple & Cinnamon) 38g	0.30	**Weight Watchers** Raspberry Pie Bar 38g	0.10	*61% less salty*
Total snack	***0.30 g***	***Total snack***	***0.10 g***	***Save 0.20 g***
Dinner				
Pastabilities Ravioli Beef with Caramelised Onion and Red Wine in Cracked Black Pepper 350g	3.75	**Lean Cuisine** Steam Beef and Mushrooms with Pasta Steams in Minutes 350g	1.40	*63% less salty*
Total dinner	***3.75 g***	***Total dinner***	***1.40 g***	***Save 2.4 g***
Total salt	**8.7 g**	**Total salt**	**3.8 g**	**Salt saved 5 g**

Typical Australian daily food intake

By switching to different brands of processed foods, **5g of salt** can be removed from the daily diet.

Global Food Monitoring Group

Aim

To bring together data on nutrient information (or lack thereof) for processed foods that can be used to drive national and international improvements in the food supply

Status

- 31 countries involved (2/3 are LMICs)
- >500,000 individual branded food items

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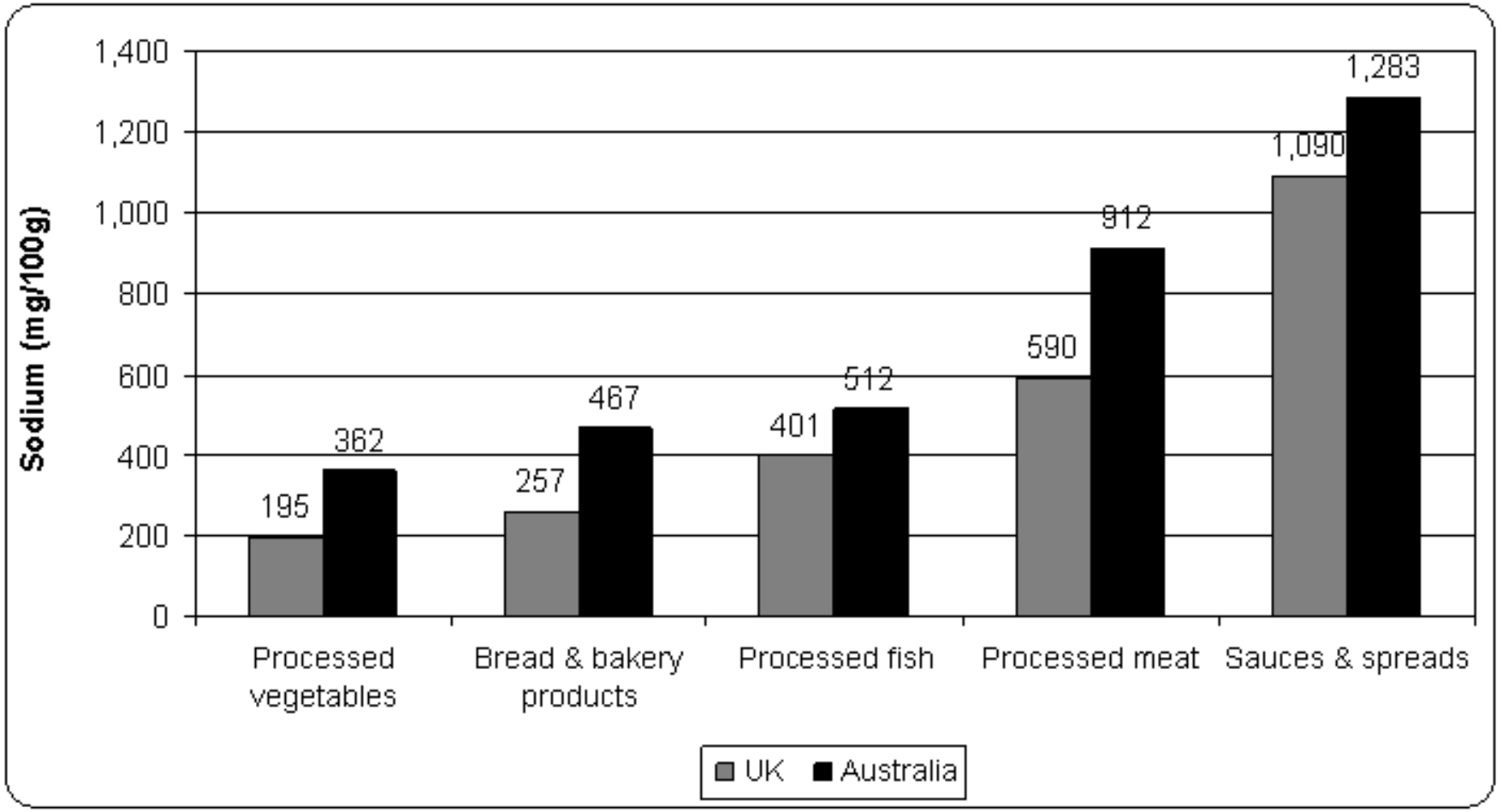
Data to compare healthfulness of foods between countries: UK and Australia



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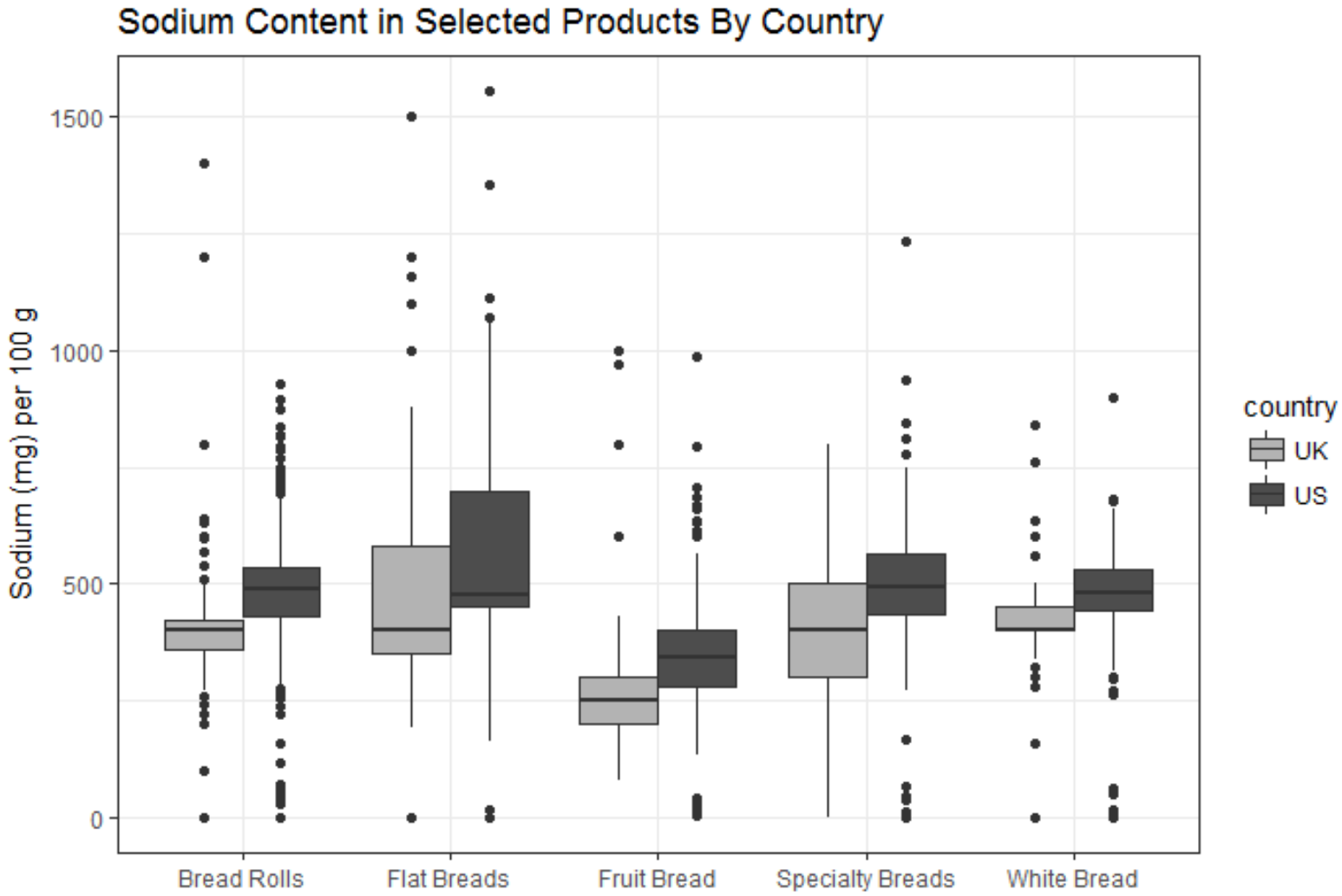
Ni Mhurchu C, et al. Am J Clin Nutr. 2010:93(3);594-600.

Data to compare healthfulness of foods between countries: UK and USA



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Coyne K, et al. Pub Hlth Nutr. 2018; 21(3):632-636.

FoodSwitch

FoodSwitch is a mobile phone app that helps consumers make healthier choices at the point of purchase, but—much more importantly—uses crowdsourcing to create a real-time, low-cost surveillance system of the packaged food supply.

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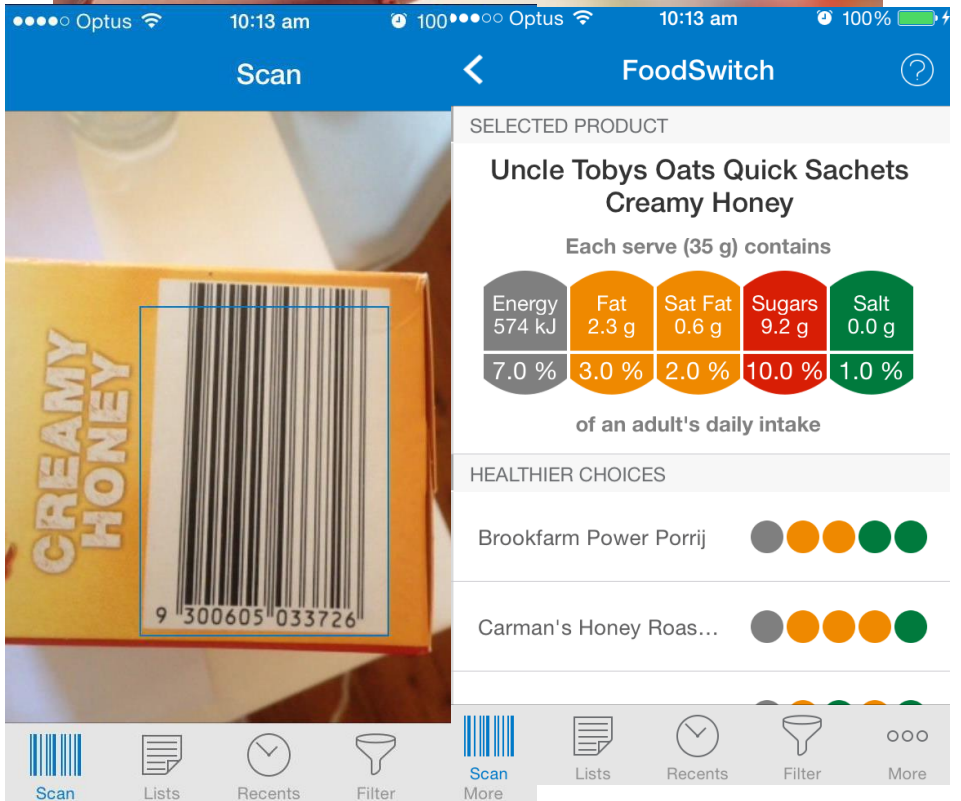

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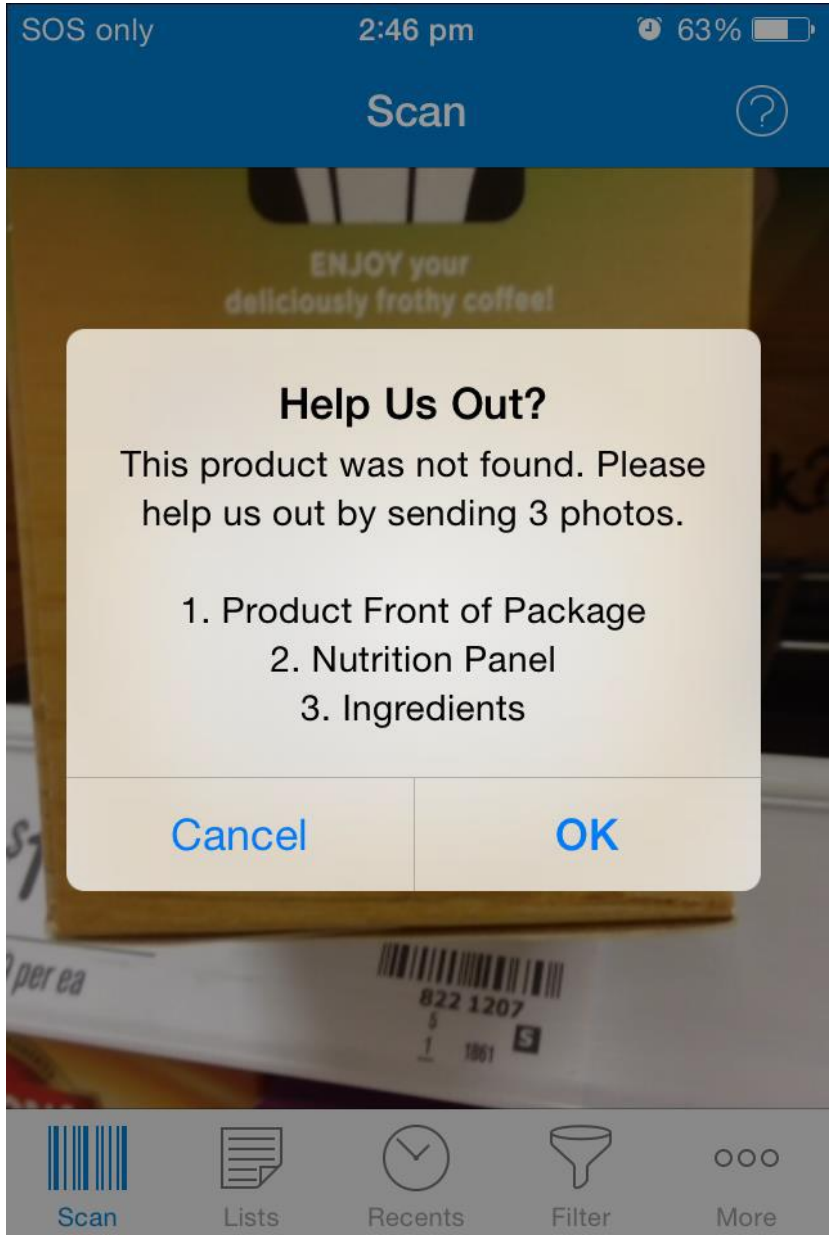
FoodSwitch

FoodSwitch is a mobile phone app that helps consumers make healthier choices at the point of purchase, but—much more importantly—uses crowdsourcing to create a real-time, low-cost surveillance system of the packaged food supply.

>26,000 photo uploads in 48 hours of launch in Australia.



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Crowd-sourced products in each country

COUNTRY	STARTED WITH…	TO DATE HAS…
AUSTRALIA	17,000	70,000+
NEW ZEALAND	8,000	25,000+
UK	70,000	100,000+
SOUTH AFRICA	7,000	14,000+

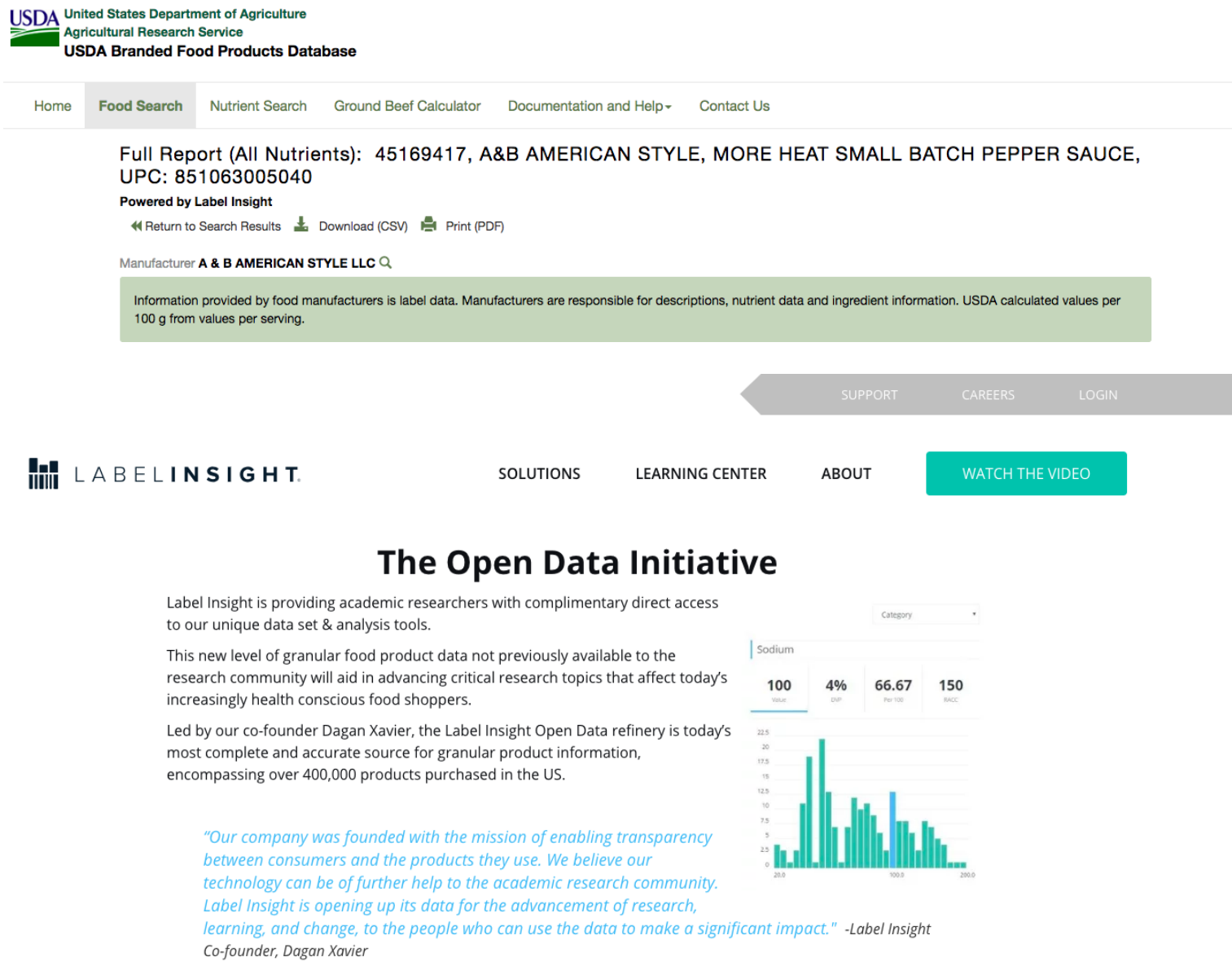
Label Insight: Origin to open data (~250,000 products)

2015: FDA removes GRAS status for trans fat foods

Label Insight helps identify foods listed as being trans fat free on Nutritional Facts Panel yet include partially hydrogenated oils

May 2018: WHO sets target to eliminate artificial trans fats globally by 2023

June 2018: FDA trans fat ban goes into effect



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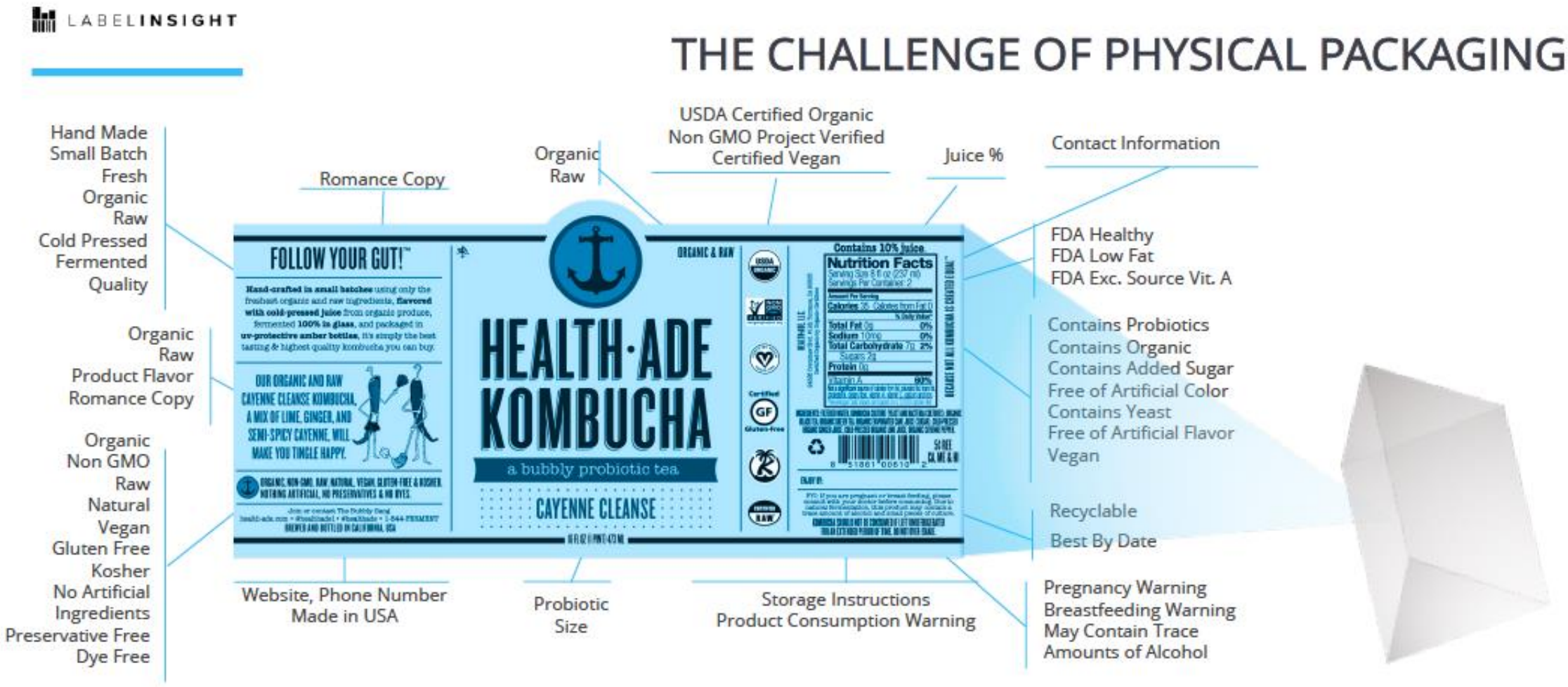
Label Insight: package flat-based data



Label Insight: label-derived data

LABELINSIGHT

EXAMPLE: YOGURT

Label Insight Captures 100% of Text Printed On Label

Nutrition Facts Panel
- Nutrients as printed
- Nutrients standardized to a per 100G & RACC

Full Ingredient Deck
- 350K+ ingredients in the Label Insight dictionary

Certification Analysis
- Kosher Certified
- Kosher Contains Dairy

Marketing Claim Analysis
- Made With Real Fruit
- Naturally and Artificially Flavored
- Excellent Source of Calcium
- Excellent Source of Vitamin D
- Low Fat
- Live Active Cultures
- Creamy
- Partially Produced with Genetic Engineering
- Rich

Derived by Label Insight

Derived = coding analysis beyond what is explicitly on label

Additive Analysis
Using CODEX Alimentarius International Food Standards
- Contains Yellow 5
- Contains Artificial Color
- Contains Artificial Sweetener
- Contains Artificial Preservative
- Contains HFCS
- Contains Added Sugars

Nutritive Analysis
using FDA regulation for marketing claims
- FDA - Excellent Source of Calcium
- FDA - Excellent Source of Vitamin D
- FDA - Good Source of Potassium
- FDA - Good Source of Vitamin A
- FDA - Healthy
- FDA - Low Cholesterol
- FDA - Low Fat
- FDA - Low Sodium
- FDA - Trans Fat Free

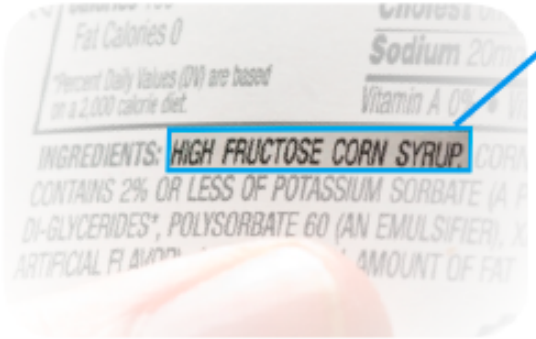
Allergen Analysis
Follows FDA FALCPA Guidelines
- Contains Milk
- Contains Lactose
- Contains Corn
- Free of Peanuts
- Free of Tree Nuts
- Free of Fish
- Free of Shellfish
- Free of Soy
- Free of Wheat
- Free of Gluten

Ingredient Analysis
- Clean Label Level 1 "Conventional Food"
- Not Vegan
- GMO Risk Corn Ingredients
- Trans Fat Free
- Does not contain probiotics
- List not exhaustive

Label Insight: label-derived data

LABELINSIGHT

EXAMPLE: HIGH FRUCTOSE CORN SYRUP



Once an ingredient is captured from the package, Label Insight can understand a range of implicit properties of that ingredient, and assign a broad range of attributes to the product based on the presence of that ingredient.

high fructose corn syrup

Number of Variations on Labels 206

Number of Products Containing 22,749

Additive Properties:
- Gelling Agent
- Glazing Agent
- Sweetener

Allergen Properties:
- Cereals
- Corn
- Sulfites

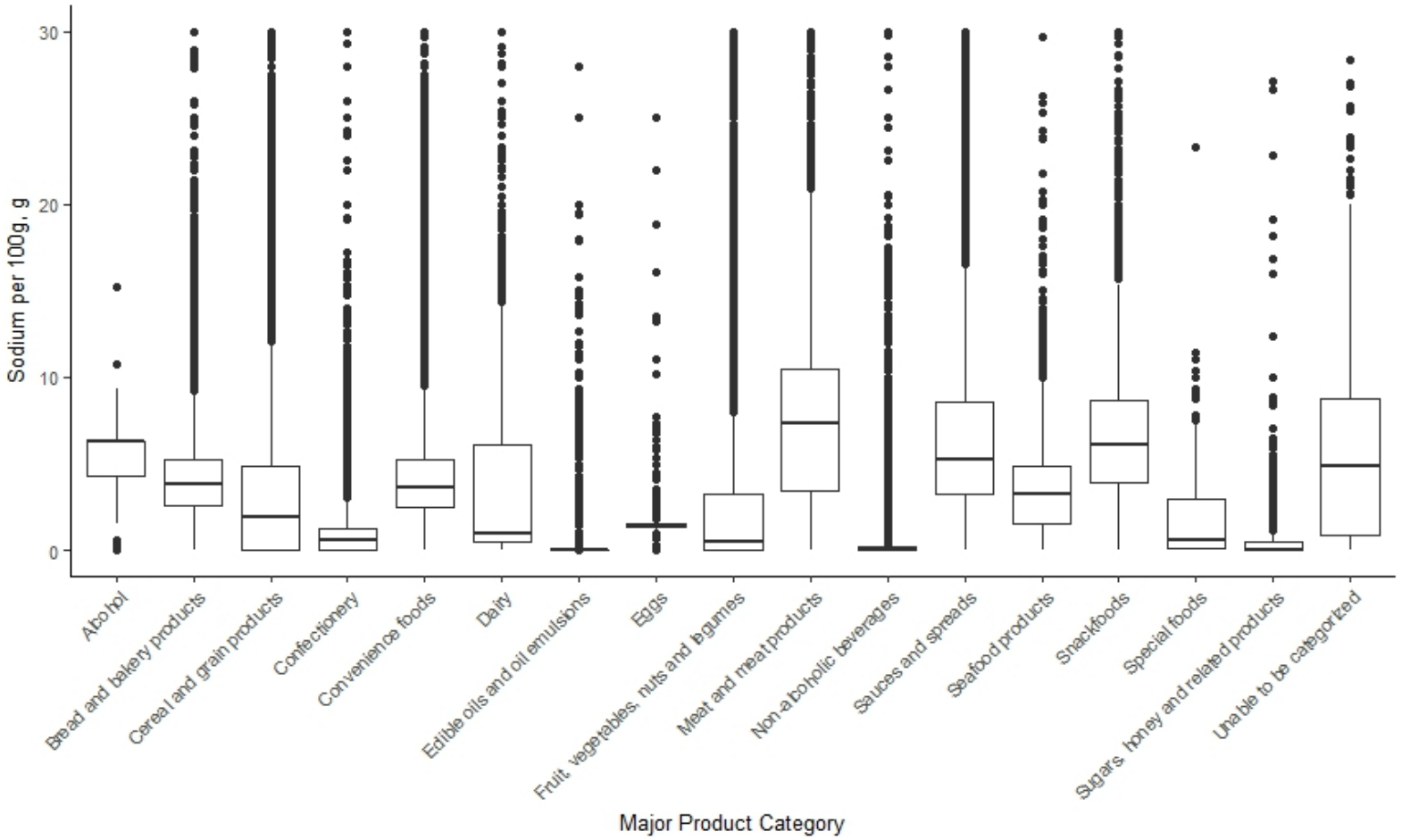
Other Properties:
- Added Sugar
- Corn Syrup Ing.
- Animal Byproducts
- Grain Ing.
- High FODMAP
- Animal Ingredients

KEY:
- CONTAINS
- MAY CONTAIN
- FREE OF

Attributes

- Panera No No List
- Whole Foods Unacceptable
- Simple Truth Unacceptable
- Target Unacceptable
- Contains Added Sugar
- Contains Gelling Agent
- Contains Glazing Agent
- Contains Sweeteners
- Contains Artificial Ingredients
- High FODMAP
- Contains Vegan Ingredients
- Contains Vegetarian Ingredients
- Contains Corn Syrup
- Contains HFCS
- GMO At Risk Ingredients
- Contains Corn Allergen
- Contains Cereal Allergen
- May Contain Sulfites
- Passes Clean Label Level 1 (Free From)
- Does Not Qualify Clean Label Level 2 (Clean)

Sodium per 100 g in the US food supply



Evaluating foods that:

- Meet AHA Heart Check criteria
- Do not meet criteria
- Are close (reformulation candidates)

Aim: Encourage reformulation through transparency and surveillance.

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WHO REPLACE: announced May 14, 2018

REPLACE

REVIEW	PROMOTE	LEGISLATE	ASSESS	CREATE	ENFORCE
dietary sources of industrially-produced trans fat and the landscape for required policy change	the replacement of industrially-produced trans fat with healthier fats and oils	or enact regulatory actions to eliminate industrially-produced trans fat	and monitor trans fat content in the food supply and changes in trans fat consumption in the population	awareness of the negative health impact of trans fat among policy-makers, producers, suppliers, and the public	compliance with policies and regulations

REPLACE TRANS FAT

World Health Organization

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REPLACE TRANS FAT

World Health Organization

WHO REPLACE calls on health departments to

Review dietary sources of industrially-produced trans-fats and how they can be substituted.

Promote the replacement of industrially-produced trans fats with healthier fats and oils.

Legislate, or change regulations to eliminate industrially-produced trans-fats.

Assess and monitor trans-fats content in the food supply and changes in how people consume trans-fats.

Create heightened awareness of the negative health impact of trans-fats among policy makers, producers, suppliers, and the public.

Enforce compliance of policies and regulations.

Ghebreyesus, Frieden. Lancet 2018; Epub ahead of print.

REVIEWS

Crowdsourcing—Harnessing the Masses to Advance Health and Medicine, a Systematic Review

Benjamin L. Ranard, AB[1], Yoonhee P. Ha, MSc[1], Zachary F. Meisel, MD, MPH, MS[3,4], David A. Asch, MD, MBA[2,3,5,6], Shawndra S. Hill, PhD[6], Lance B. Becker, MD[4], Anne K. Seymour, MS[7], and Raina M. Merchant, MD, MSHP[2,3,4]

[1]Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA, USA; [2]Penn Medicine Center for Innovation, University of Pennsylvania, Philadelphia, PA, USA; [3]The Leonard Davis Institute of Health Economics, University of Pennsylvania, Philadelphia, PA, USA; [4]Department of Emergency Medicine, University of Pennsylvania, Philadelphia, PA, USA; [5]Philadelphia Veterans Affairs Medical Center, Philadelphia, PA, USA; [6]The Wharton School, University of Pennsylvania, Philadelphia, PA, USA; [7]University of Pennsylvania Libraries, University of Pennsylvania, Philadelphia, PA, USA.

OBJECTIVE: Crowdsourcing research allows investigators to engage thousands of people to provide either data or data analysis. However, prior work has not documented the use of crowdsourcing in health and medical research. We sought to systematically review the literature to describe the scope of crowdsourcing in health research and to create a taxonomy to characterize past uses of this methodology for health and medical research. ***DATA SOURCES:*** PubMed, Embase, and CINAHL should be collected and reported to provide clarity and comparability in methods.

KEY WORDS: crowdsourcing; crowd sourcing; citizen scientist; citizen science; human computing.
J Gen Intern Med 29(1):187–203
DOI: 10.1007/s11606-013-2536-8

Examples of crowdsourcing tasks by domain

Task	Example
Problem solving	Foldit: online platform for predicting proteins' 3º structure
Data processing	MalariaSpot: online game to tag images of parasites on thick smears containing *Plasmodium falciparum* at medium to low parasitemias
Surveillance or monitoring	MyHeartMap Challenge: mapping AEDs via smartphone photographs
Surveying	Amazon MTurk for survey administration to capture a wider range of participants more quickly

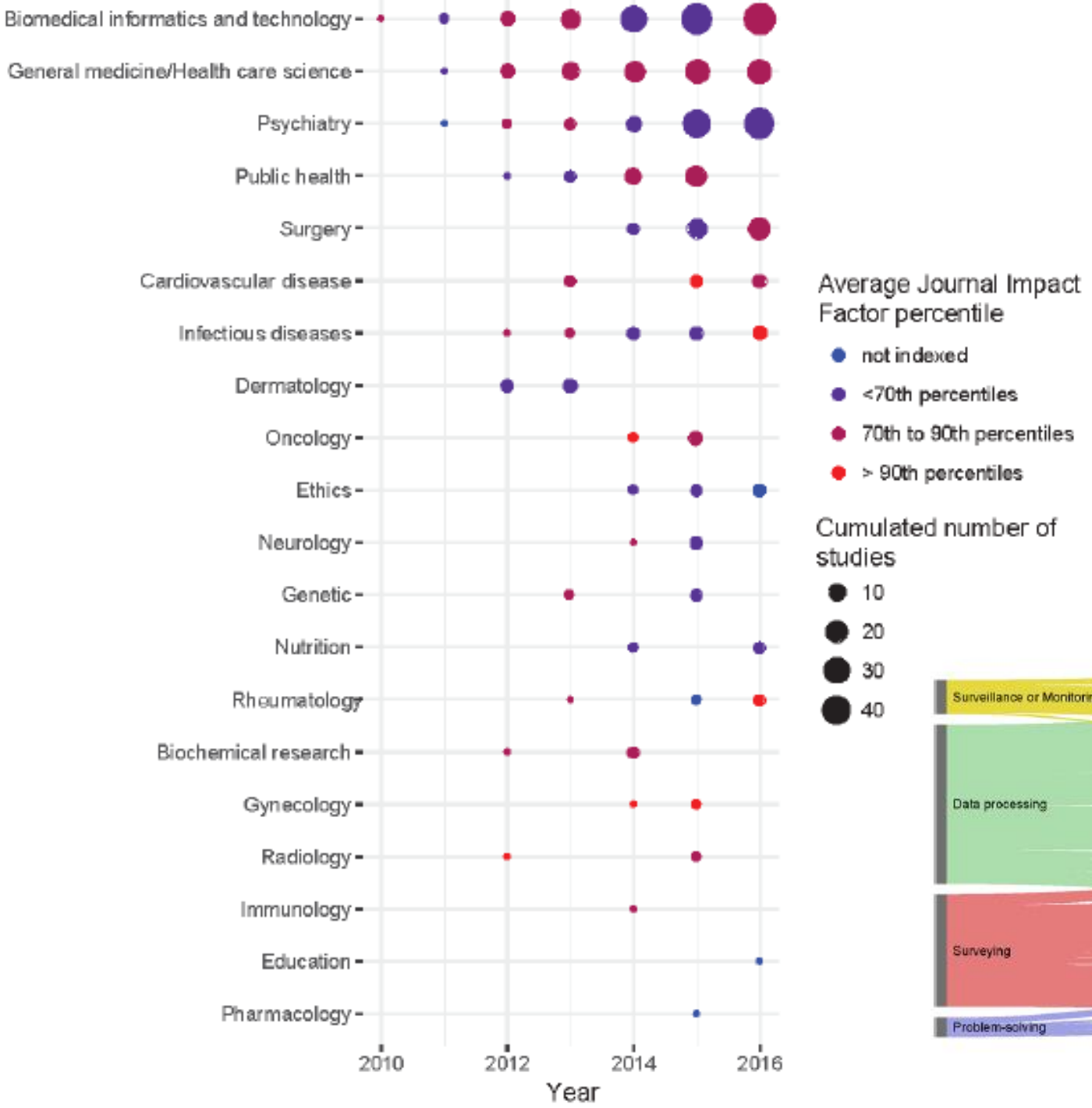
J Gen Intern Med 2014 Jan;29(1):187-203

Logistics of Crowdsourcing/Crowd Worker Characteristics

Data were collected across the following domains:

- Microtasks versus mega task
- Platform, validation, comparison with experts
- Monetary or other incentives, training, qualifications
- Number of crowd workers and their characteristics

J Med Internet Res 2018;20(5):e187.



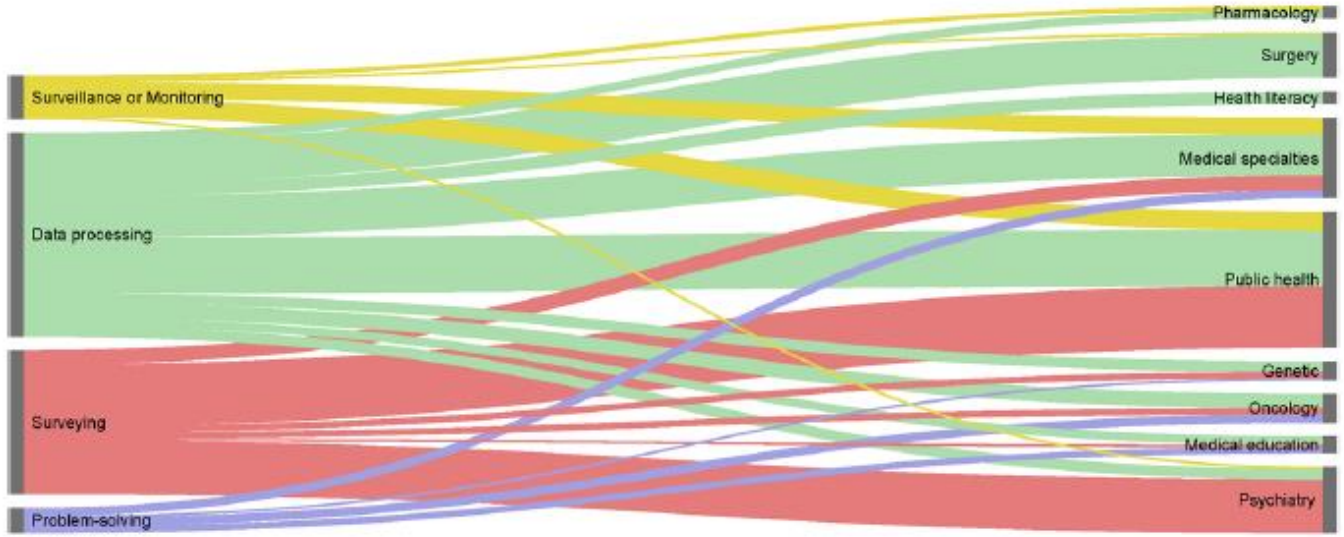
N=202 studies (9 RCTs)

Median (IQR) crowd size: 424 (167, 802)

Median (IQR) age: 34 (32, 36) years

Leading task: data processing

Poor description of crowdsourcing logistics and crowd characteristics



J Med Internet Res 2018;20(5):e187.

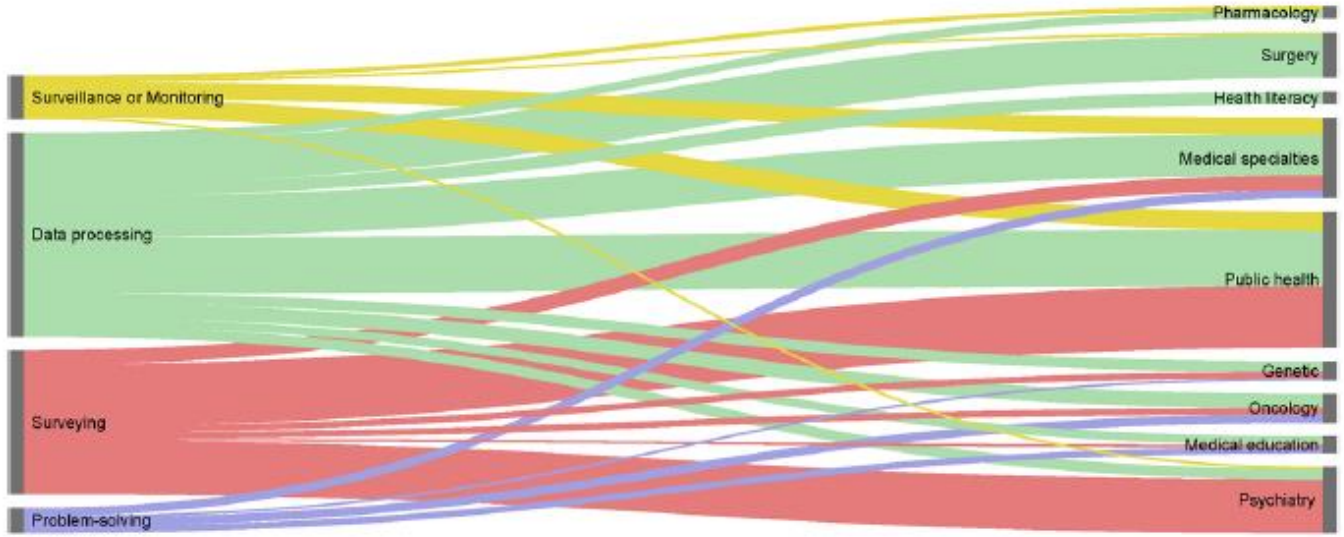
Labor market platform: 94%

Previous experience necessary: 54%

Compensation: 50%, $1 or less per task

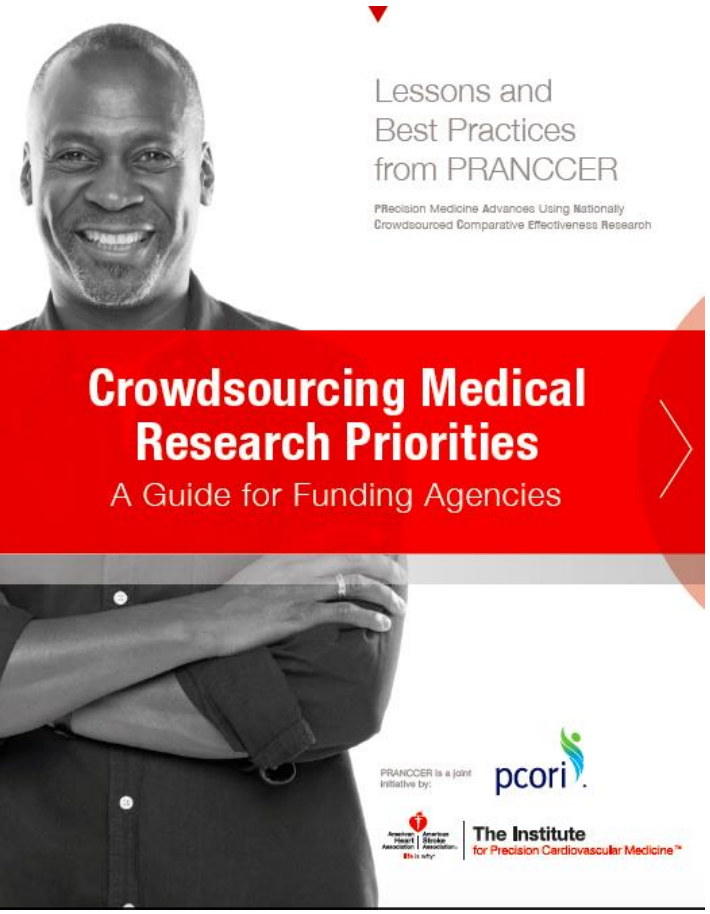
Task time: 1 minute

Validation: 12%



J Med Internet Res 2018;20(5):e187.

Crowdsourcing for health research



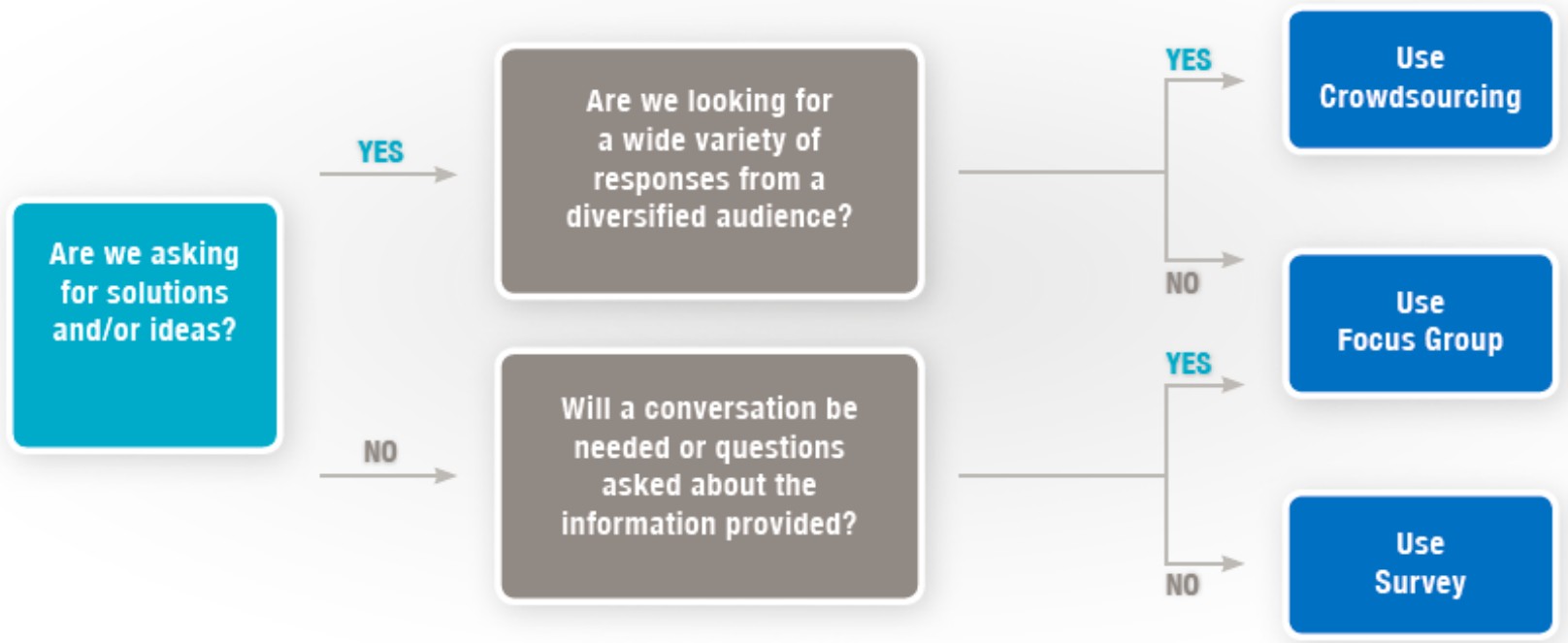


Figure 1

Process flow to discern when to use scientific crowdsourcing vs alternative options. Note that crowdsourcing can be used for both solutions and ideas.

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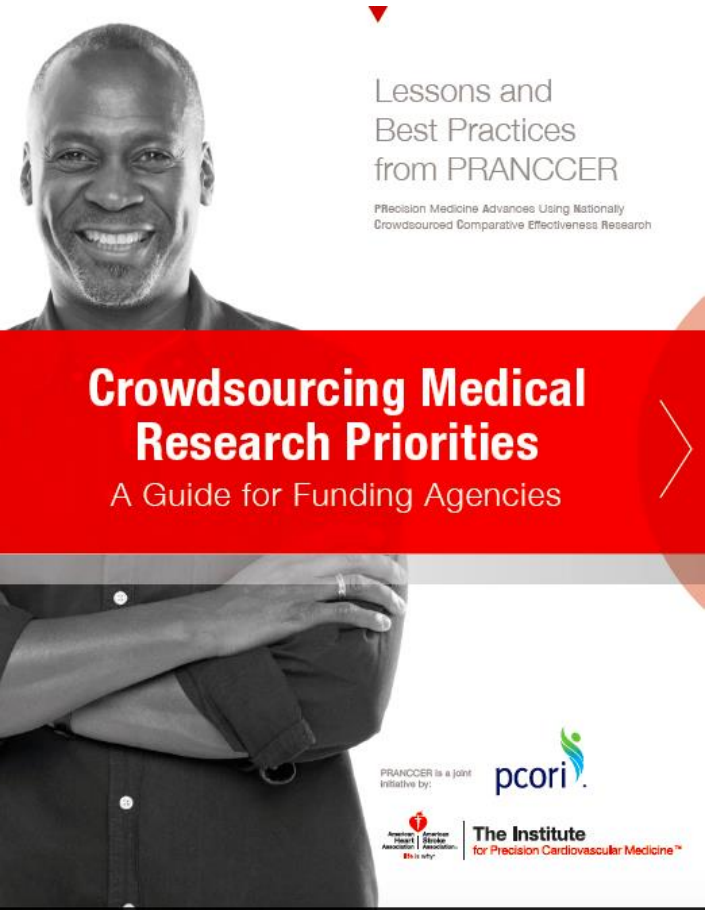
Crowdsourcing for health research



I Need			I Use
Specific Solutions	> Generate independent high-value solutions to highly challenging technical and analytical problems	> Defining the problem in a generalized way and removing company-specific details to protect Intellectual Property (IP)	Campaigns and Contests
People to Share Ideas	> Open collaboration within an organization or externally with multiple diverse stakeholder groups	> Engaging participation, establishing a shared purpose, culture, and cohesiveness > Protecting IP	Collaborative Communities
	Purpose	Challenges	

Figure 2

When and how to use the crowd. Adapted with permission from *Harvard Business Review*.[2]

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Crowdsourcing for health research

Table 3

Core Implementation Stages for an Ideation Campaign

Plan	Design	Launch	Evaluate
Determine campaign-specific: > Desired outcomes > Leadership expectations > Target audience > Success metrics > Response process > Plan for reviewing and using entries > Timeline > Communications plan	> Draft challenge language > Determine custom entry fields > Set evaluation criteria > Draft entry tips and FAQs > Write communications materials > Set up and test the website > Organize team workflow and roles	> Send communications > Activate the campaign > Moderate incoming entries > Address users' questions > Capture metrics > Provide points for weekly report > Draft follow-up communications	> Close and archive the campaign > Initiate the evaluation process > Communicate status and results to users > Run metrics > Draft final report with data analysis

Crowdsourcing examples: activity, tobacco, dialysis


Research

JAMA Cardiology | Original Investigation

Feasibility of Obtaining Measures of Lifestyle From a Smartphone App

The MyHeart Counts Cardiovascular Health Study

Michael V. McConnell, MD, MSEE; Anna Shcherbina, MEng; Aleksandra Pavlovic, BS; Julian R. Homburger, BS; Rachel L. Goldfeder, MS; Daryl Waggot, MSc; Mildred K. Cho, PhD; Mary E. Rosenberger, PhD; William L. Haskell, PhD; Jonathan Myers, PhD; Mary Ann Champagne, RN, MS; Emmanuel Mignot, MD, PhD; Martin Landray, MB, ChB, PhD; Lionel Tarassenko, MA, DPhil; Robert A. Harrington, MD; Alan C. Yeung, MD; Euan A. Ashley, MB, ChB, DPhil

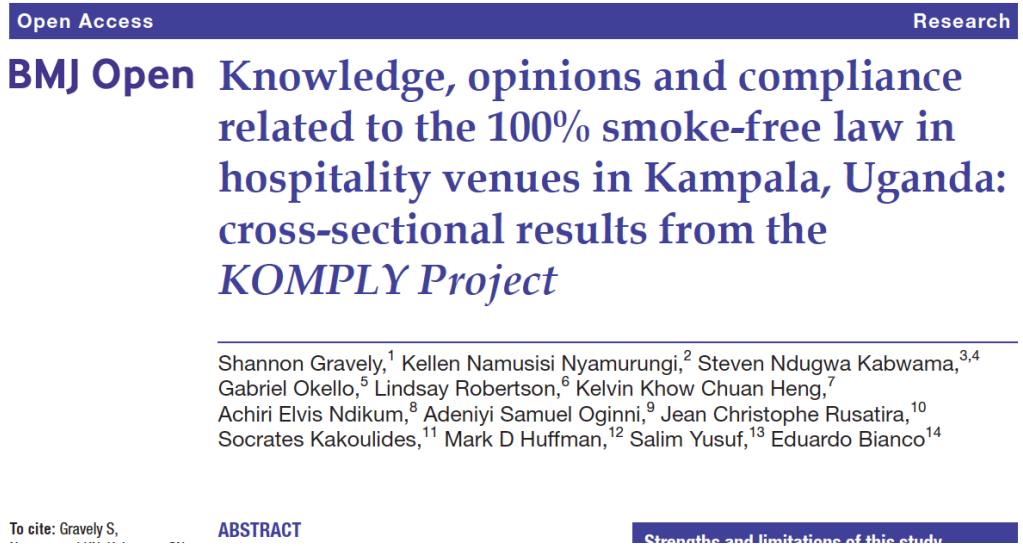
IMPORTANCE Studies have established the importance of physical activity and fitness, yet limited data exist on the associations between objective, real-world physical activity patterns, fitness, sleep, and cardiovascular health.

OBJECTIVES To assess the feasibility of obtaining measures of physical activity, fitness, and sleep from smartphones and to gain insights into activity patterns associated with life

Invited Commentary page and Editor's Note page 78

Author Audio Interview at jamacardiology.com

Supplemental content at jamacardiology.com


Open Access Research

BMJ Open

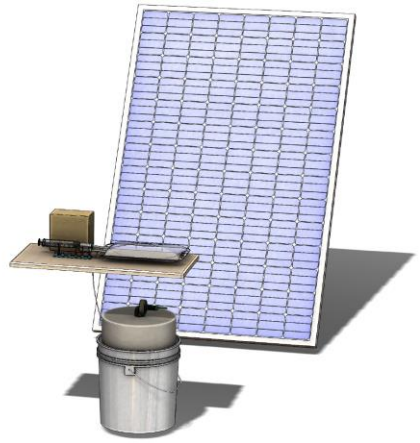
Knowledge, opinions and compliance related to the 100% smoke-free law in hospitality venues in Kampala, Uganda: cross-sectional results from the *KOMPLY Project*

Shannon Gravely,[1] Kellen Namusisi Nyamurungi,[2] Steven Ndugwa Kabwama,[3,4] Gabriel Okello,[5] Lindsay Robertson,[6] Kelvin Khow Chuan Heng,[7] Achiri Elvis Ndikum,[8] Adeniyi Samuel Oginni,[9] Jean Christophe Rusatira,[10] Socrates Kakoulides,[11] Mark D Huffman,[12] Salim Yusuf,[13] Eduardo Bianco[14]

To cite: Gravely S,

ABSTRACT

Strengths and limitations of this study



- 48,968 users
- 4990 users provided 6MWT data

- 222 bars/restaurants evaluated in Kampala
- Structured observations and $PM_{2.5}$ data collected through trainees' participation

- Solar powered peritoneal dialysis machine converts water into steam to sterilize dialysate

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FoodSwitch as platform for trials

nutrients

MDPI

Article

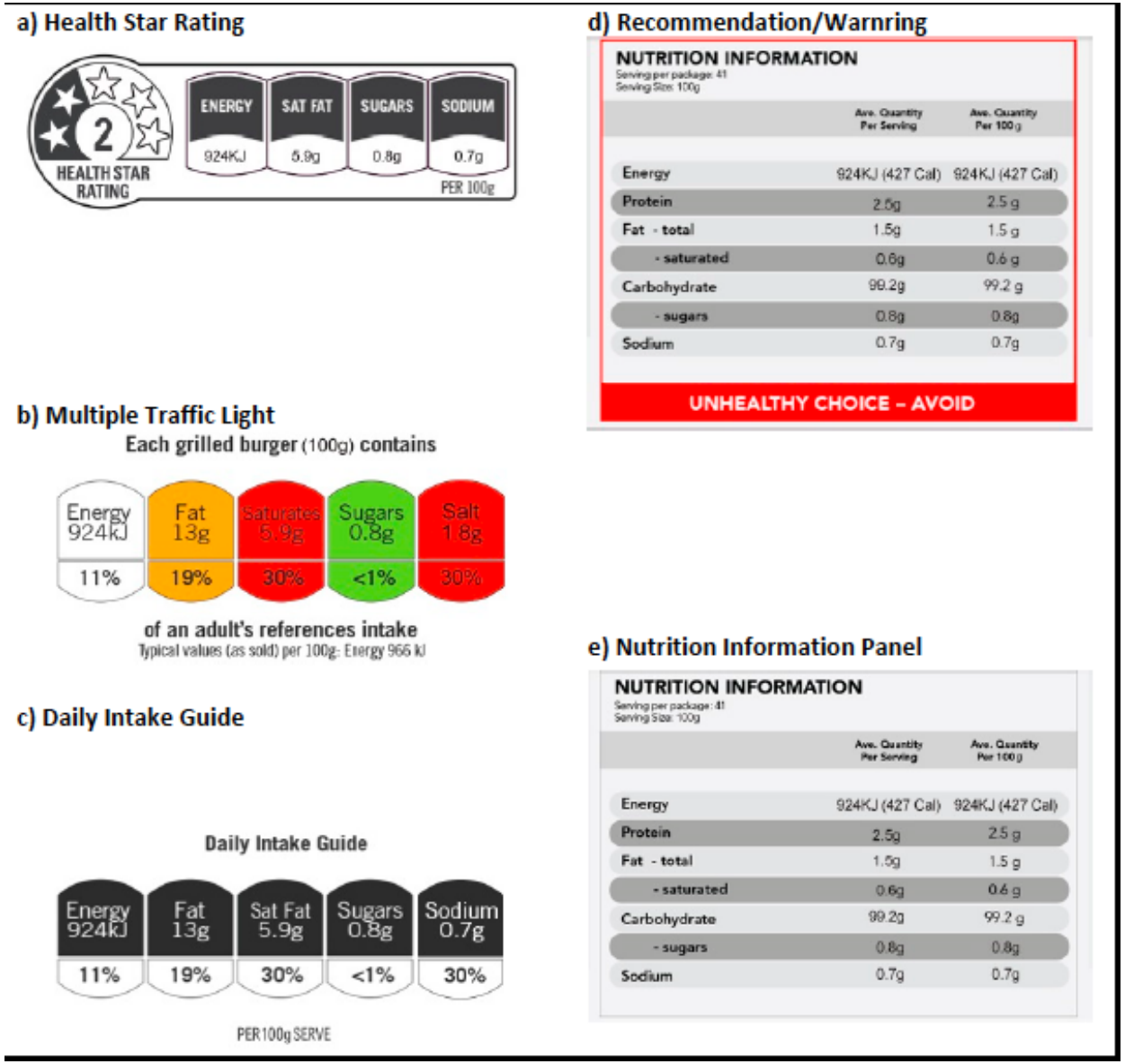
Effects of Different Types of Front-of-Pack Labelling Information on the Healthiness of Food Purchases—A Randomised Controlled Trial

Bruce Neal [1,2,3,4,*], Michelle Crino [1], Elizabeth Dunford [1,5], Annie Gao [1], Rohan Greenland [6], Nicole Li [1], Judith Ngai [7], Cliona Ni Mhurchu [8], Simone Pettigrew [9], Gary Sacks [10], Jacqui Webster [1] and Jason H. Y. Wu [1]

[1] The George Institute for Global Health, University of New South Wales, Sydney, NSW 2042, Australia; mcrino@georgeinstitute.org.au (M.C.); edunford@georgeinstitute.org.au (E.D.); agao@georgeinstitute.org.au (A.G.); nli@georgeinstitute.org.au (N.L.); iwebster@georgeinstitute.org.au (J.W.); iwu1@georgeinstitute.org.au (J.H.Y.W.)

Which food label is most effective at improving consumer choices?

Which type do consumers prefer?



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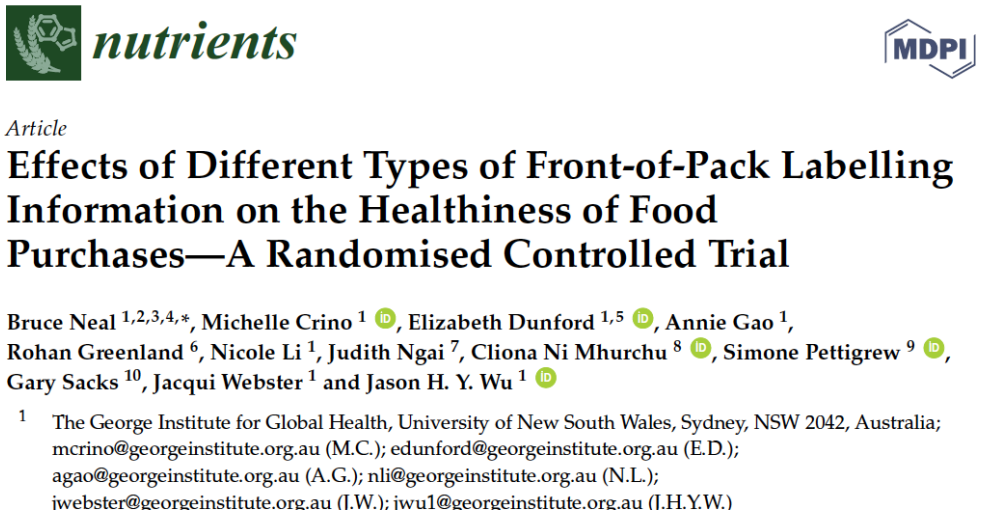
FoodSwitch as platform for trials



nutrients

MDPI

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[1] The George Institute for Global Health, University of New South Wales, Sydney, NSW 2042, Australia; mcrino@georgeinstitute.org.au (M.C.); edunford@georgeinstitute.org.au (E.D.); agao@georgeinstitute.org.au (A.G.); nli@georgeinstitute.org.au (N.L.); iwebster@georgeinstitute.org.au (J.W.); jwu1@georgeinstitute.org.au (J.H.Y.W.)

N=1578 randomized over 18 months

Mean (SD) age: 38 years, 84% women

Prior FS use: 7%

1º outcome: mean transformed nutrient profile score at 4 weeks, non-inferiority

Which food label is most effective at improving consumer choices?

Health Stars were non-inferior for 1º outcome and for preference

Which type do consumers prefer?

Warning-based labels were superior for 1º outcome (higher cost)

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FoodSwitch as platform for trials

nutrients

MDPI

Article

Effects of Different Types of Front-of-Pack Labelling Information on the Healthiness of Food Purchases—A Randomised Controlled Trial

Bruce Neal [1,2,3,4,*], Michelle Crino [1], Elizabeth Dunford [1,5], Annie Gao [1], Rohan Greenland [6], Nicole Li [1], Judith Ngai [7], Cliona Ni Mhurchu [8], Simone Pettigrew [9], Gary Sacks [10], Jacqui Webster [1] and Jason H. Y. Wu [1]

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N=1578 randomized over 18 months

Mean (SD) age: 38 years, 84% women

Prior FS use: 7%

1º outcome: mean transformed nutrient profile score at 4 weeks, non-inferiority

Table 3. Effects of each type of front-of-pack labelling compared to control on healthiness of food purchases (mean differences and 95% confidence interval).

	MTL vs. NIP	*p* Superiority	DIG vs. NIP	*p* Superiority	HSR vs. NIP	*p* Superiority	WARN vs. NIP	*p* Superiority
Primary outcome								
Mean transformed Nutrient Profile Score	0.74 (−0.11, 1.58)	0.09	−0.31 (−1.15, 0.52)	0.46	0.37 (−0.47, 1.21)	0.39	0.87 (0.03, 1.72)	0.04
Secondary outcomes								
Mean total sugar g/100 g	−0.89 (−1.74, −0.03)	0.04	−0.35 (−1.20, 0.49)	0.41	−0.48 (−1.33, 0.37)	0.27	−0.57 (−1.43, 0.28)	0.19
Mean sodium mg/100 g	−2 (−31, 28)	0.91	−12 (−41, 17)	0.41	11 (−18, 40)	0.47	−2 (−31, 28)	0.91
Mean saturated fat g/100 g	−0.30 (−0.68, 0.08)	0.12	0.02 (−0.35, 0.39)	0.92	−0.19 (−0.57, 0.18)	0.31	−0.14 (−0.52, 0.23)	0.45
Mean energy content kJ/100 g	−26 (−63, 11)	0.16	7 (−29, 43)	0.71	−1 (−37, 36)	0.98	−8 (−45, 28)	0.65
Mean spend/4 weeks (A$)	0.11 (−0.05, 0.27)	0.17	0.08 (−0.07, 0.24)	0.29	0.14 (−0.01, 0.30)	0.07	0.16 (0.002, 0.32)	0.05

Superiority: 2-sided *p*-value testing at $p < 0.05$. Health Star Rating (HSR), Multiple Traffic Lights (MTL), Daily Intake Guide (DIG), Recommendations/warnings (WARN), Nutrition Information Panel (NIP).

Can smartphone technology support consumers in purchasing lower salt foods?

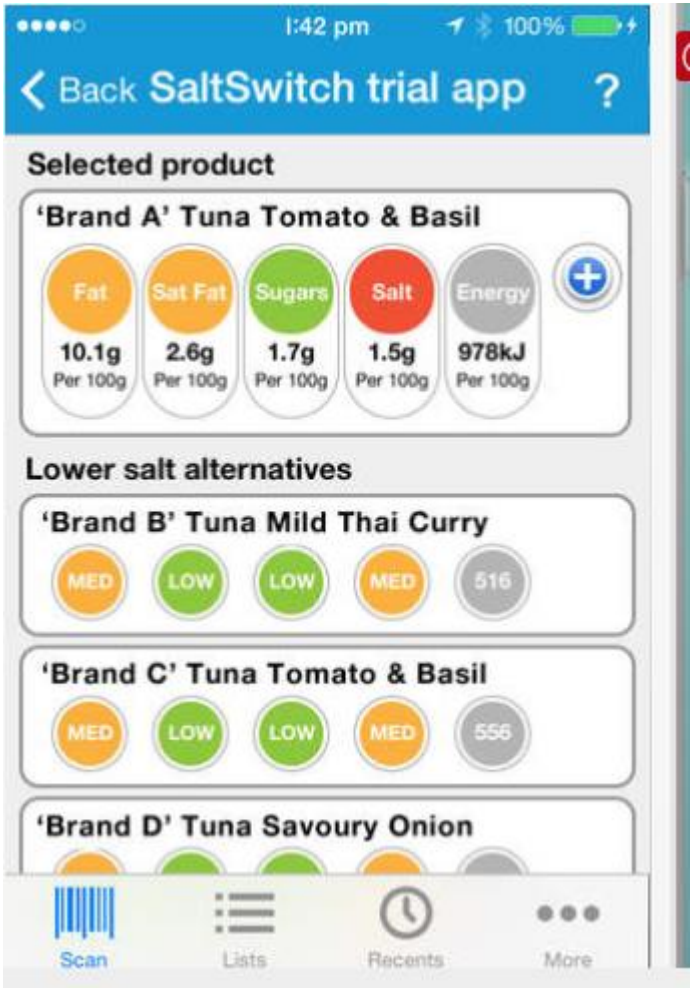
P = Online grocery shoppers with hypertension

I = SaltSwitch

C = General food information

O = 1) Sodium content in food purchases collected through online grocery accounts, 2) home BP linked to research record, 3) self-collected urinary sodium

T=12 weeks



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Should/could FoodSwitch pursue FDA regulation as a mobile medical app?

SaMD=Software as Medical Device

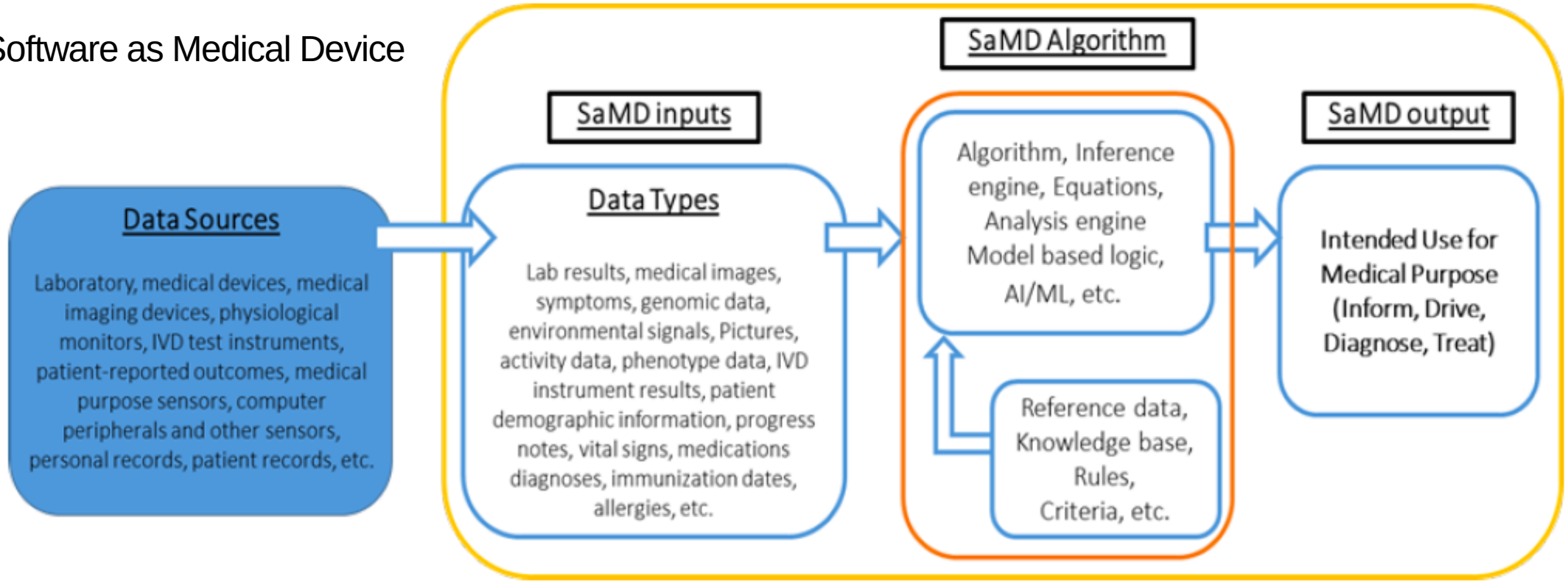

Figure 1. Description of SaMD, including possible data sources from which inputs are derived and that may be used for one or more medical purposes.

FDA Digital Innovation Health Plan, 2017.

FDA Software Pre-Cert. Program, 2018.

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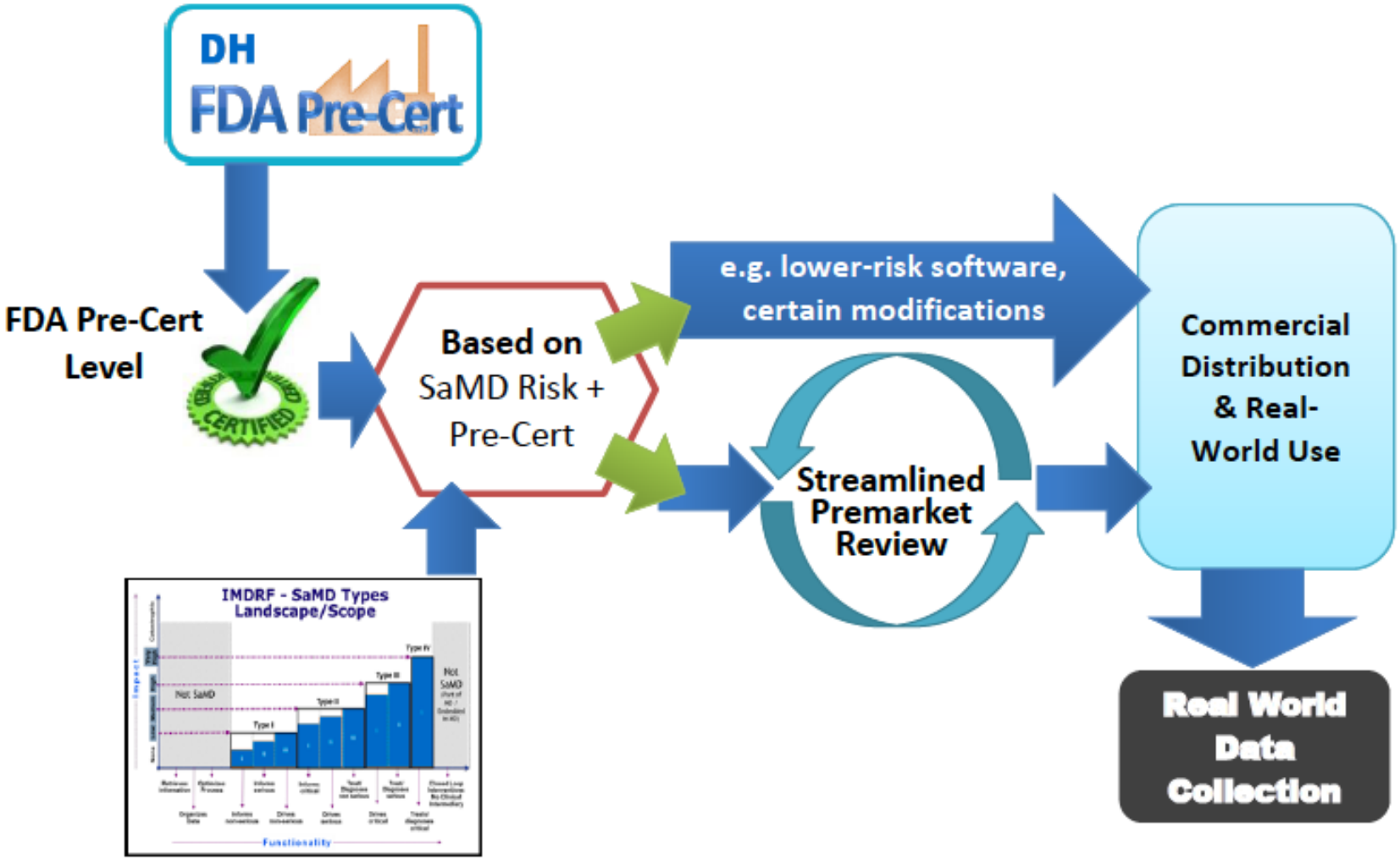

FDA Software Pre-Certification Program aims to provide more streamlined and efficient regulatory oversight of software-based medical devices from manufacturers who have demonstrated a robust culture of quality and organizational excellence (CQOE) and are committed to monitoring real-world performance

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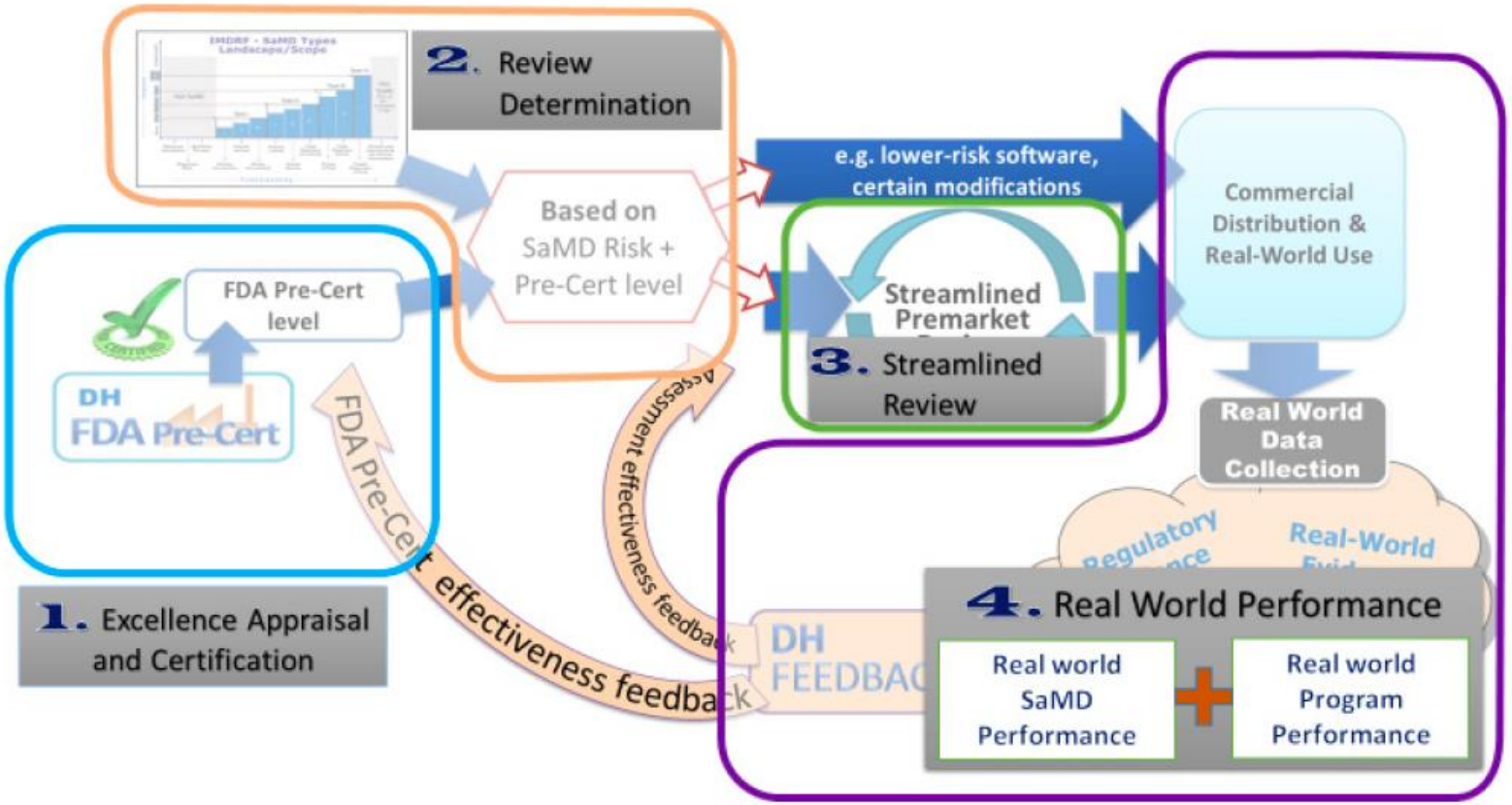

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Take Home Points

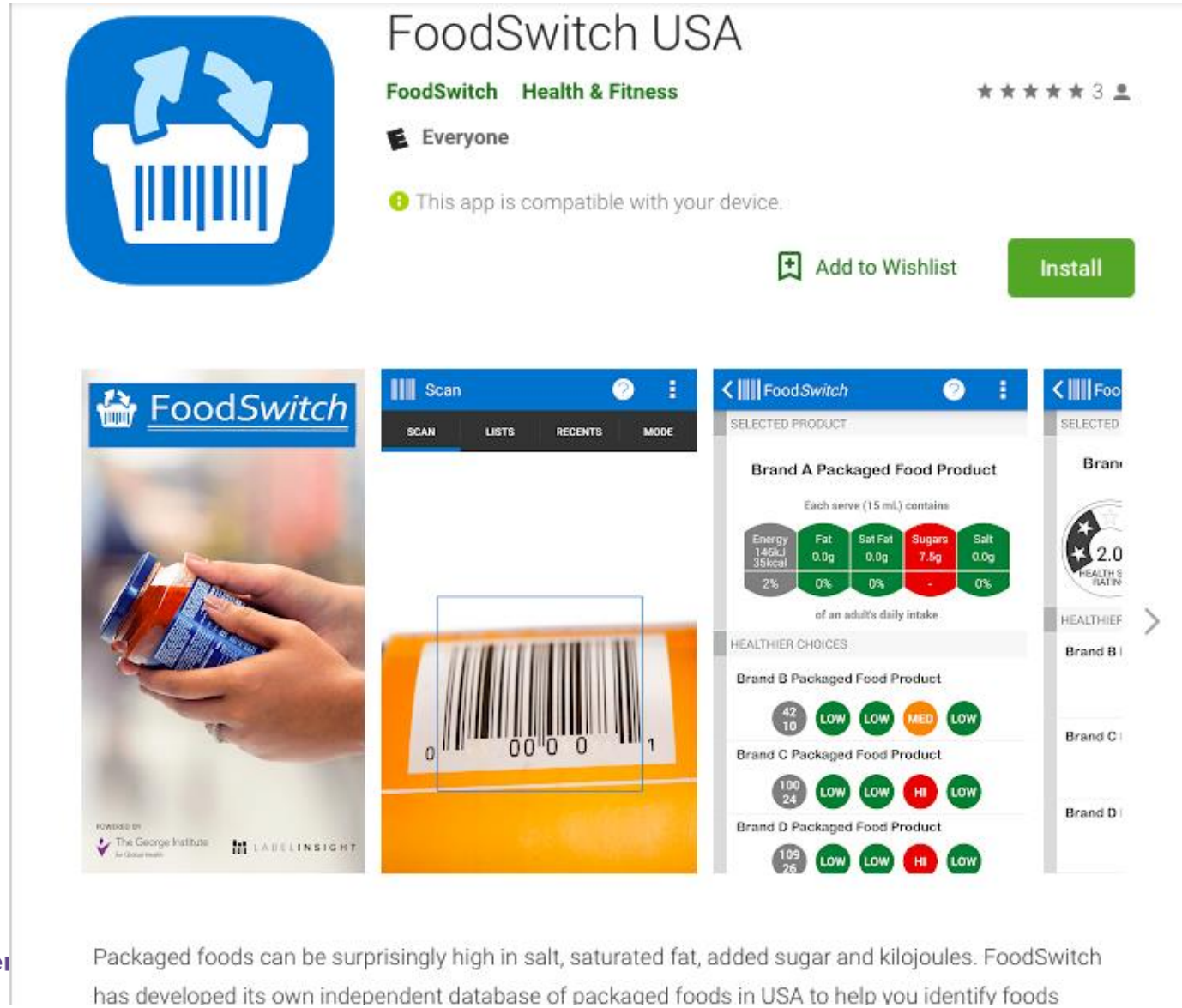
Surveillance of the global packaged food supply is necessary to improve its healthfulness: trans fats and salt are exemplars.

FoodSwitch is a mobile phone app that uses crowdsourcing for packaged food surveillance on a brand-level and is available in the US.

Crowdsourcing is an increasingly prevalent approach for mutual reinforcing activities of generating ideas, data collection, and community engagement.

Mobile- and online-based trials provide opportunities for lower cost, scalable interventions yet require new partnerships for sustainability.

Download FoodSwitch for iOS or Android



Packaged foods can be surprisingly high in salt, saturated fat, added sugar and kilojoules. FoodSwitch has developed its own independent database of packaged foods in USA to help you identify foods

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Acknowledgments

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FoodSwitch: A mobile platform for packaged food surveillance and behavioral research

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