



Food Insecurity and Health Care |

Addressing Food Insecurity through the Health Care System in New York

Appendix

December 2021

Appendix

Food insecurity context in US and NYS

Impact assessment

Promising practices

Innovation

Food insecurity context in the US and in New York State

Five categories of food-insecure individuals



Adult only

~400k adult only households food-insecure¹

Not eligible for SNAP working 40 hours/week at minimum wage² (200% FPL)



Families

~335k families food-insecure²

Qualify for more SNAP and WIC

Balancing work, childcare, sourcing and preparing food



Seniors

~75k seniors living alone food-insecure

Less likely to have income and have higher medical costs

Limited mobility to access resources



Unemployed

Reduces or eliminates a household's income

Can lead to unexpected changes in food security

Likely need full nutrition support



Homeless

Also likely need full nutrition support

Unable to store food or keep produce fresh

1. Includes households with an adult and senior. 2. NY minimum wage is \$12.50/hr. 3. Includes single and dual parent households, and seniors living with children.
Note: Figures based on national averages and adjusted to New York
Source: USDA

Other factors
can further
amplify food
insecurity,
such as...



Language

Not speaking English can limit ability to participate in interventions (e.g., classes, screening programs)



Knowledge

Not knowing how to buy and cook healthy food on a budget can leave people running out of food



Mobility

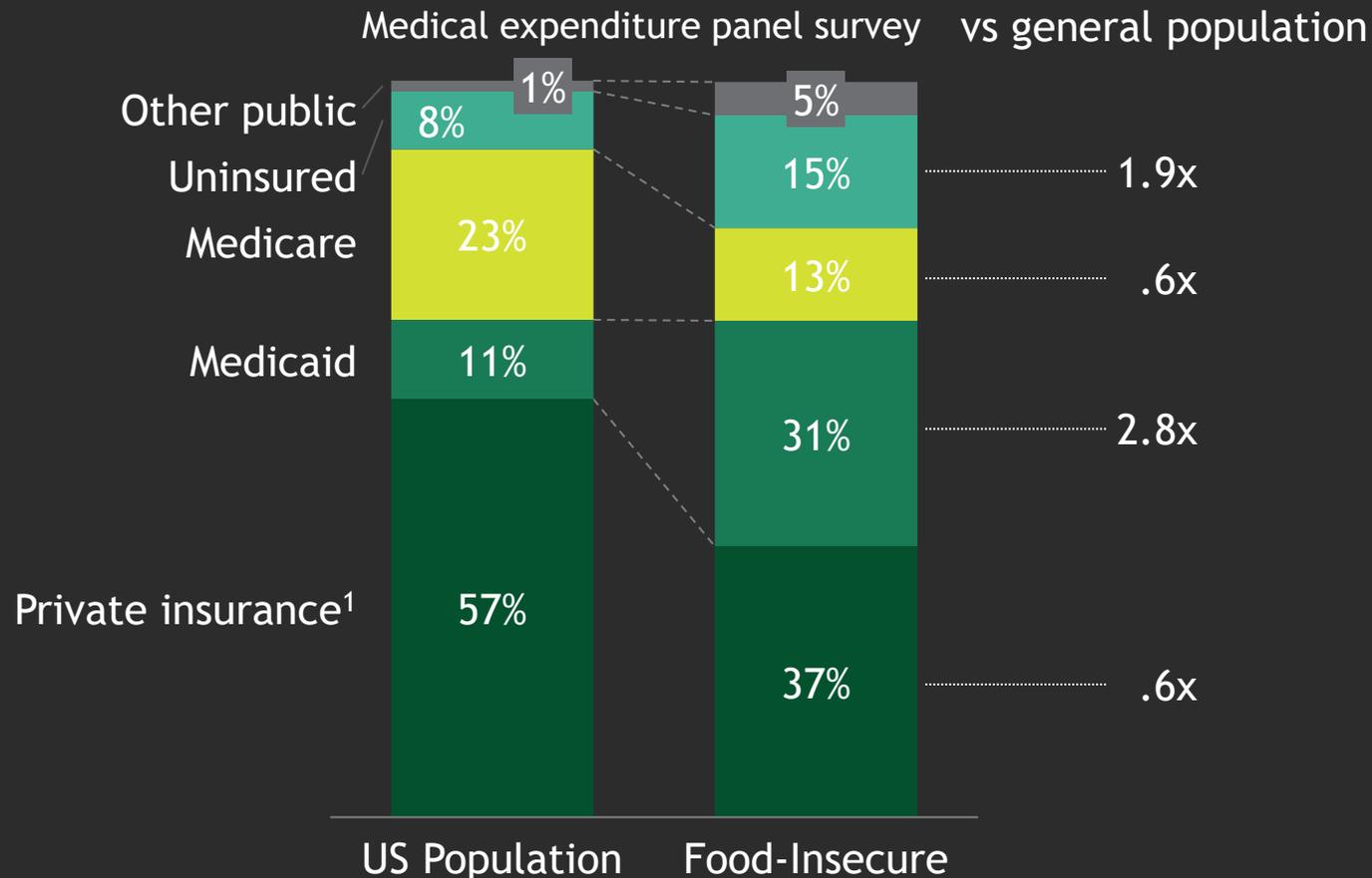
Without a car or good public transportation, will struggle to get to the intervention sites



Availability

Might live in areas that have no healthy food options

Medicaid 2.8x over-represented among food-insecure



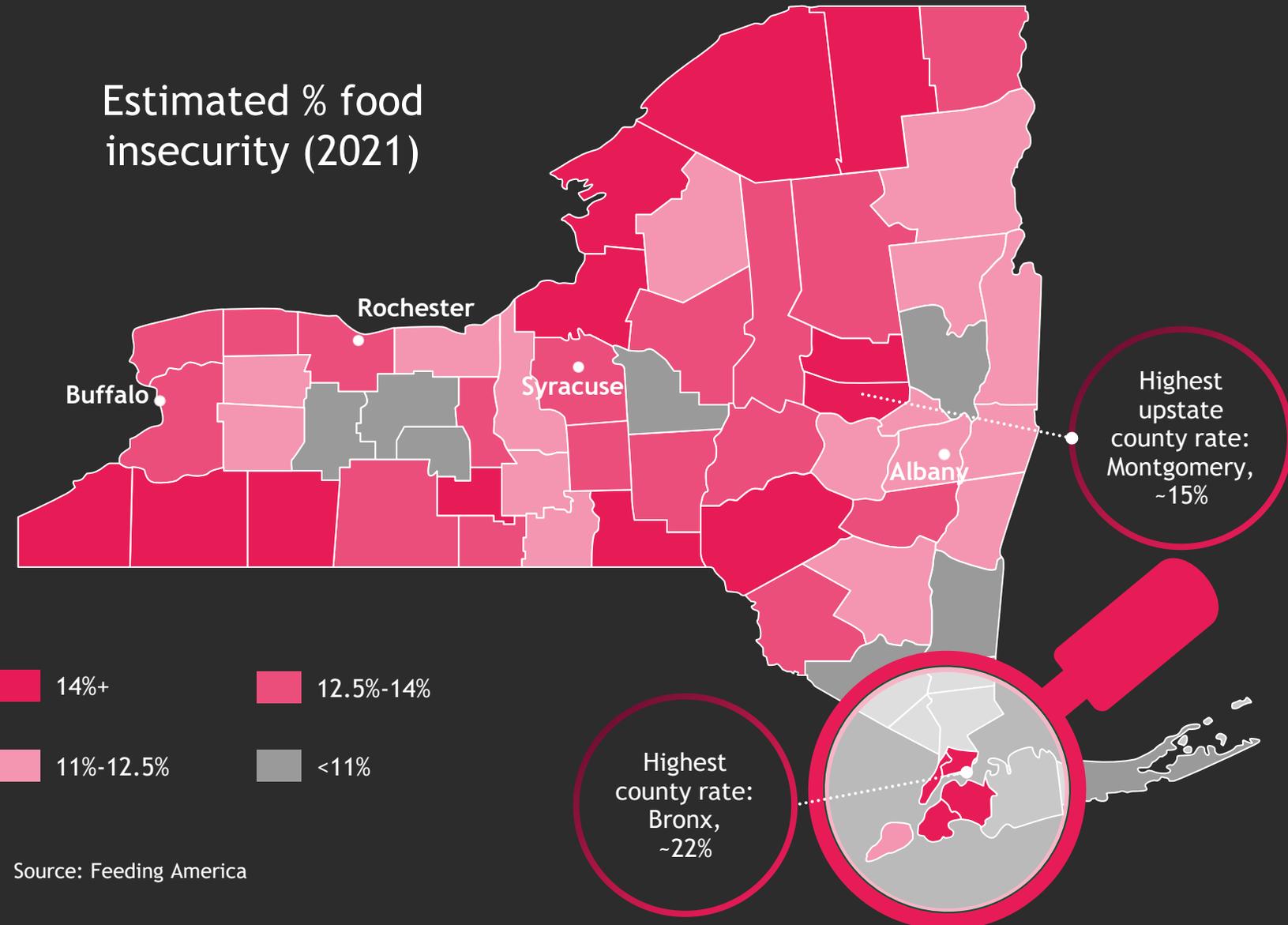
1 in 2 food-insecure individuals covered by government insurance

1 in 3 food-insecure individuals are privately insured

1. Includes employer-sponsored insurance and non-group
Source: CDC; HHS; Medical Expenditure Panel Survey; Census

Both NYC and rural NYS have high levels of food insecurity...

Estimated % food insecurity (2021)



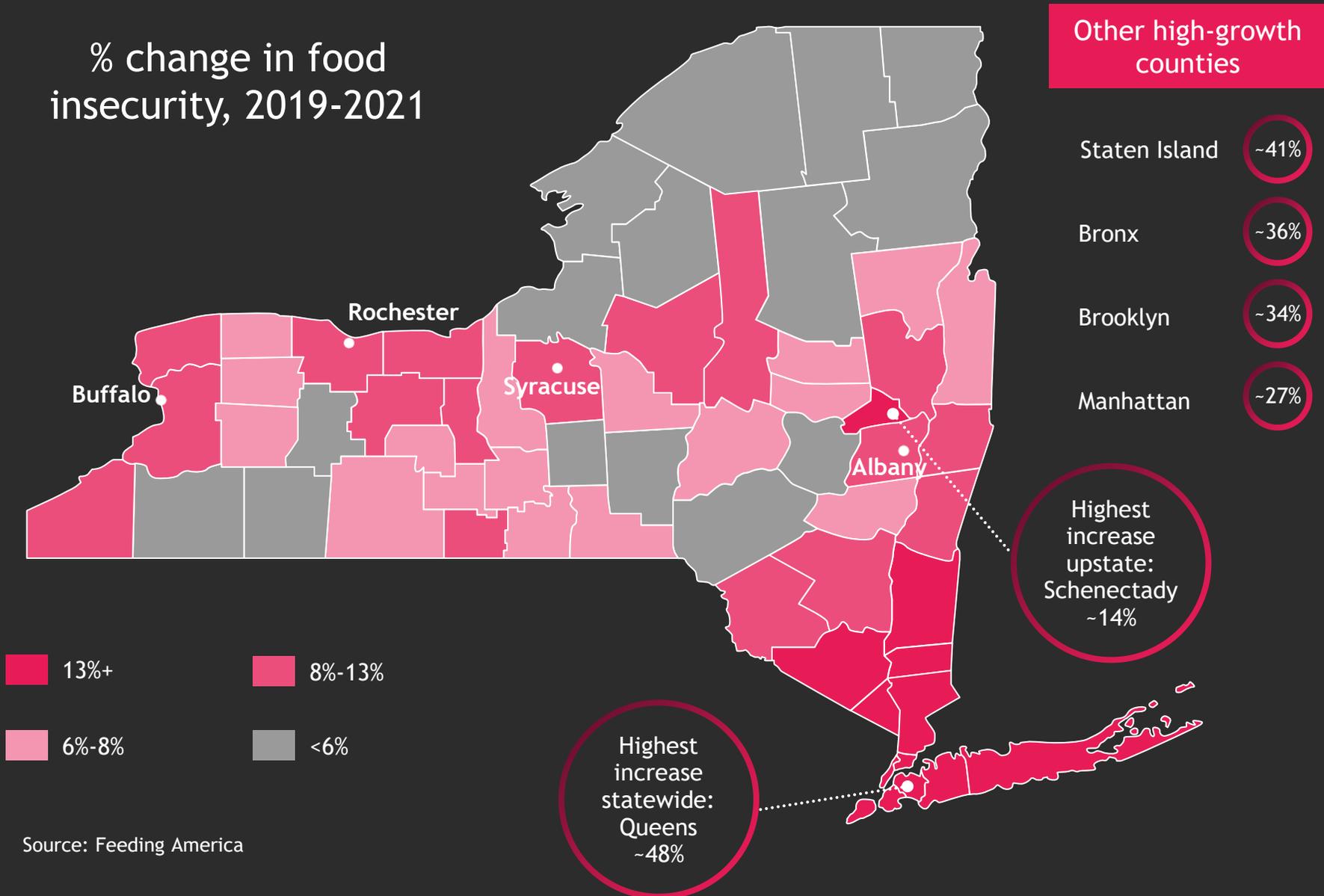
4 of top 5 food-insecure counties in NYS in 2019 were upstate/rural

Since COVID, top three food-insecure counties are all in NYC

Source: Feeding America

... but increases during COVID centered around NYC

% change in food insecurity, 2019-2021



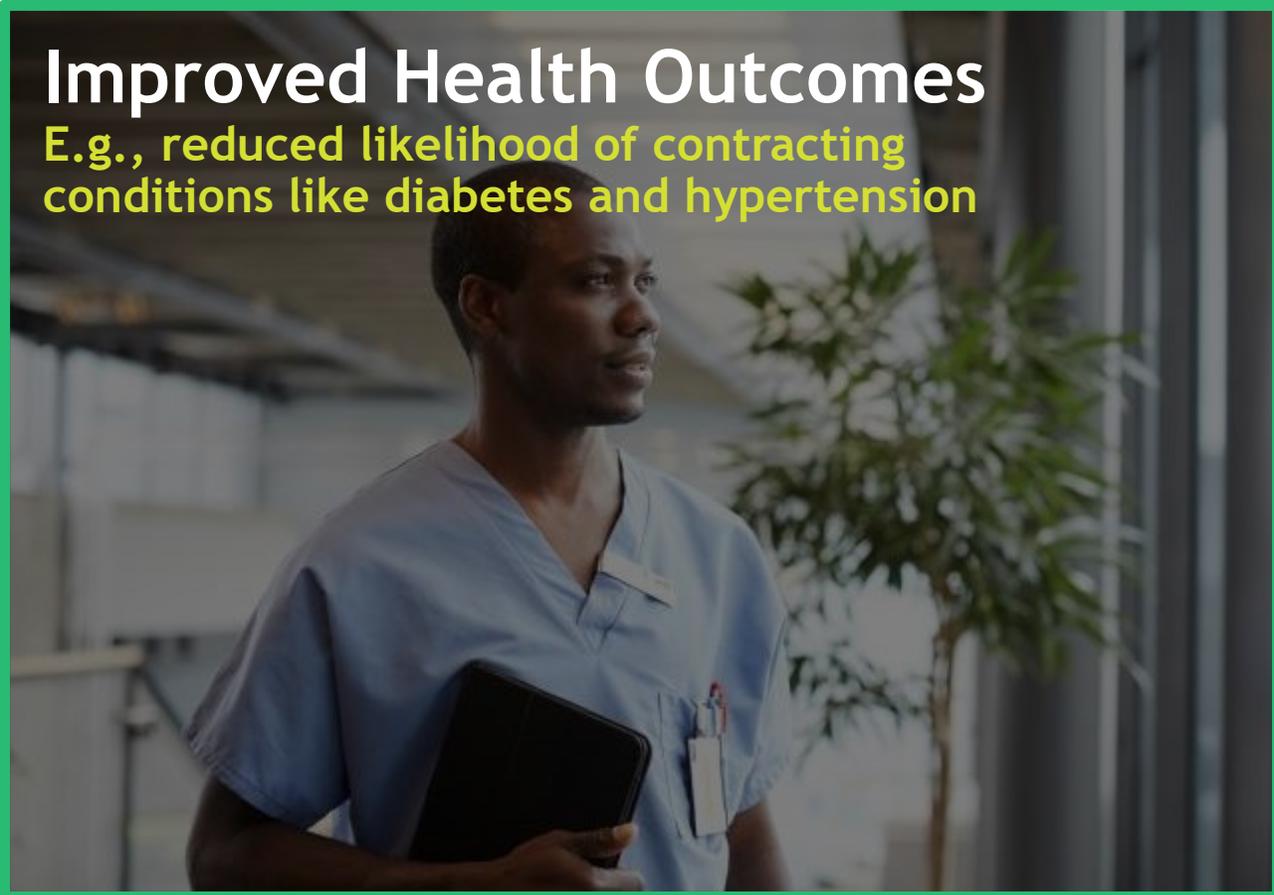
Source: Feeding America

Impact assessment

Societal impact
considers both ...

Improved Health Outcomes

E.g., reduced likelihood of contracting
conditions like diabetes and hypertension



Socioeconomic Outcomes

E.g., higher productivity and graduation rate
among food-secure population



When assessing impact, it is necessary to quantify improvement on health...

We focused on conditions that:



Affect a large portion of New York



Disproportionately affect FI population



Require expensive treatment



Have sufficient data available

We can estimate total impact using prevalence rate and annual health costs

	FI Individuals Affected (M)	Health Cost per Individual (\$K) ¹
<i>Hypertension</i>	0.8	2.4
<i>Diabetes</i>	0.3	11.1
<i>COPD²</i>	0.3	8.0
<i>Stroke</i>	0.1	17.0

1. National average total 2020 estimated direct healthcare costs (inpatient, outpatient, Rx) across all payer types

2. Chronic obstructive pulmonary disease

Source: USDA, American Heart Association, American Diabetes Association, National Institutes of Health

... and consider the socioeconomic ramifications



Schooling

Missed school days

Graduation rate

College enrollment rate



Criminal justice

More likely to engage in criminal behavior

Higher incarceration rate



Productivity

FI population less productive than their FS counterparts



Substance use

Higher chance of drug/alcohol use and addiction

There are significant savings associated with reducing food insecurity

At the individual level, there are two sources of HC savings

Accounting for hypertension, COPD, diabetes, and stroke gives:

Lower Cost of Treatment



Possible Prevention



For every 1,000 individuals becoming food secure, we can expect:



(range of ~\$400K to \$1.8M)

in annual health care cost savings after applying a 50/50 split to the two savings figures

Reducing Food Insecurity

Past Interventions

Example Study	Support	FI Decrease	Methodology
Pasadena Health Center 2016-2017, TX 172 participants	Participants were given "Food Rx" cards that could be redeemed at local food pantry. Nutrition booklets in English and Spanish	94% ¹	After 6 months of support <ul style="list-style-type: none">• FI decreased from baseline of 100% to 5.9% by visit 12
Franklin Community Health 2017-2018, MA 122 participants	Individuals received weekly produce from June to November (not delivered)	65% ¹	Self-reported surveys <ul style="list-style-type: none">• Control group FI dropped from 42% to 32%• Intervention group FI fell from 31% to 11%
Project Open Hand 2017, CA 72 participants	The 6-month intervention provided food meant to meet 100% of daily energy requirements and nutritional guidelines for a healthy diet	64% ¹	After 6 months of support <ul style="list-style-type: none">• Participants with very low FS dropped from 60% to 12%• Participants with low FS dropped from 21% to 17%
SNAP 1996/2001/2004, all US ~40k households	Provides benefits to eligible individuals to be redeemed on food in retail stores	31%	Considered a sample of low-income households and assessed impact of SNAP during 3 separate years
National School Lunch Program 2012, all US 3,796 participants	Provides eligible school children with free or reduced-price lunch in public schools	15%	FI for kids who received NSLP dropped from 40.5% to 34.6% food insecure

1. Short-term small-scale interventions targeting highly insecure individuals tend to see greater impact

Return on Investment

Past Interventions

Example Study	Support	ROI Factor	Methodology
Maine Medical Center 2013-2015, ME 622 participants	Provider administered home-delivered meals over the course of 2 years to Medicare recipients	4.87x	Cost to administer was \$43,540 Savings from reduced readmission rate was \$212,160 per patient (readmission rate dropped by 6.3pts)
SNAP 2010, MN	Provides benefits to eligible individuals to be redeemed on food in retail stores	2.1x-2.7x	Estimates benefits of averted cost of hunger (\$2.13 to \$2.74) for every \$1 spent on federal food aid
IMPACT 2013-2014, PA 302 participants	Community health program delivering tailored support for high-risk patients	2.5x	One team of community health workers spends ~\$568K on program expenses to achieve Medicaid savings of ~\$1.4M
SNAP 2012, MD 68,956 participants	Provides benefits to eligible individuals to be redeemed on food in retail stores	2.3x	Average monthly supplemental income from SNAP was \$129/month per person SNAP participants had 14% lower odds of hospitalization (average cost of \$25,091) in subsequent year
Commonwealth Care Alliance 2016-2018, MA 3,077 participants	Provides benefits to eligible individuals to be redeemed on food in retail stores	1.1x-1.6x	Cost to administer was \$350/month per patient for tailored meals (\$146 for non-tailored) Health savings of \$570/month for tailored recipients (\$156 for non-tailored)
Project Angel Heart 2013, CO ~3,000 participants	Participants received 5 to 10 free, medically tailored meals, delivered to their homes each week	1.0x	\$2,414/year in health care cost savings Cost: \$199.54/month

Reduction in Health Care Spend

Past Interventions

Example Study	Support	Reduction in Annual HC Spend	Methodology
Horizon Blue Cross Blue Shield 2020, NJ ~1,000 participants	Community health program targeting high-cost members, sponsored by a payer-provider partnership	\$2,900	Fully insured high-risk members were provided with support. Participants saw a 25% reduction in total cost of care (~\$11,500 annual average)
Project Angel Heart 2013, CO ~3,000 participants	Medically tailored meals provided to individuals living with life-threatening illnesses. Organized by a partnership made up provider, payers, and local org	\$2,400	Estimated savings of \$4.2M for 1,740 people <ul style="list-style-type: none">• \$736/month for participants with CHF¹• \$453/month for participants with diabetes• \$416/month for participants with COPD
Commonwealth Care Alliance 2016-2018, MA 3,077 participants	Recipients received 5 days' worth of lunches, dinners, and snacks delivered to their homes each week	\$1,800 to \$6,800	Due to reduced readmission rate, savings of: <ul style="list-style-type: none">• \$570/month per individual for the medically tailored group• \$156/month per individual for non-tailored
SNAP 2011-2013, all US 4,447 participants	Provides benefits to eligible individuals to be redeemed on food in retail stores	\$1,400	Compared 2012 and 2013 health expenditures between those who received SNAP during 2011 (intervention) and those who did not but were eligible (control)

1. Congestive heart failure

Quantifying Health Care Savings

General Approach: Using a Probability-Based Model



Probabilistic approach

Our methodology builds up health care costs for an *individual person* with FI status, allowing us to calculate the *average* impact for a transition out of FI



Accounting for comorbidities

Considering the likelihood that any person will have any of the 4 separate conditions accounts for the possibility of them having >1 condition¹

Example:

	FI Patient w/Condition
Diabetes Only	\$11K
Stroke Only	\$17K
Diabetes + Stroke ²	\$30K

Avg. FI Person
Modeled

\$3.8K³

1. By using average treatment costs as inputs to the model, we are partially accounting for the different rates paid by patients with comorbidities
2. The true cost of treating 2 conditions simultaneously is expected to be higher than treating each individual condition separately, making the savings figures estimated conservative; per BMC Medicine study the incremental cost factor to treat stroke if you already have diabetes is 1.15
3. Includes all 4 of the conditions studied (diabetes, stroke, COPD, hypertension) weighted according to their likelihood

Quantifying improved health outcomes

Reduced Spend - Methodology

Savings associated with lowering treatment cost down to FS level

Modeled at the individual person level, taking likelihood of each separate condition into account

	Avg. Annual Cost of Treatment	FI Increased Cost	FI Incremental Cost of Treatment		Condition Prevalence Rate (FI)	=	Annual Savings / Avg. Individual	OOP / Payer	
								Cost Split %	Savings Contribution
<i>Hypertension</i>	\$2,137	16%	\$331	x	32%	=	\$106	22% 78%	\$23 \$82
<i>Diabetes</i>	\$10,128	11%	\$1,116	x	12%	=	\$139	21% 79%	\$30 \$109
<i>Stroke</i>	\$15,390	12%	\$1,770	x	4%	=	\$47 ¹	9% 91%	\$4 \$42
<i>COPD</i>	\$7,466	8%	\$570	x	12%	=	\$67	4% 96%	\$2 \$65

Note: select figures have been rounded for presentation purposes

1. Adjusted to discount for high upfront cost of stroke

Source: CDC, USDA, American Heart Association, American Diabetes Association, NIH, CMS, Kaiser Family Foundation

~\$400

~\$50
~\$350

Quantifying improved health outcomes

Potential Prevention - Methodology

Food insecurity is only one of several factors that influences higher prevalence rate

Savings associated with decreased likelihood of condition

Modeled at the individual person level, taking likelihood of each separate condition into account

	Condition Prevalence Rate (FI)	Condition Prevalence Rate (FS)	FI Annual Cost of Treatment	Annual Savings / Avg. Individual	OOP / Payer	
					Cost Split %	Savings Contribution
<i>Hypertension</i>	(32% - 20%)	x	\$2,425	= \$277	22% 78%	\$61 \$215
<i>Diabetes</i>	(12% - 7%)	x	\$11,096	= \$589	21% 79%	\$127 \$463
<i>Stroke</i>	(4% - 2%)	x	\$16,927	= \$421	9% 91%	\$382 \$39
<i>COPD</i>	(12% - 5%)	x	\$7,961	= \$515	4% 96%	\$19 \$496

Note: select figures have been rounded for presentation purposes
 Source: CDC, USDA, American Heart Association, American Diabetes Association, NIH, CMS, Kaiser Family Foundation

~\$1,800

~\$250
~\$1,550

Quantifying improved health outcomes

Sources and Assumptions

All \$ figures inflated to 2020
 All sources denote national averages
 All cost figures are blended (private and public payer)

Disease	Metric	Number	Source
Hypertension	<i>Prevalence Rate FI</i>	32%	USDA, 2017
Diabetes		12%	
Stroke		4%	
COPD		12%	
Hypertension	<i>Prevalence Rate FS</i>	20%	
Diabetes		7%	
Stroke		2%	
COPD		5%	
Hypertension	<i>Avg. Annual Cost of Treatment</i>	\$ 2,137	American Heart Association, 2014
Diabetes		\$ 10,128	American Diabetes Association, 2017
Stroke ¹		\$ 15,390	National Institute of Health, 2017
COPD		\$ 7,466	National Institute of Health, 2016
Hypertension	<i>FI/FS Increased Cost Multiple²</i>	1.16	CDC, 2015
Diabetes		1.11	
Stroke		1.12	
COPD		1.08	
Hypertension	<i>OOP vs Payer Cost Split³</i>	22/78	Chronic Condition Data Warehouse, 2018 and Kaiser Family Foundation, 2016
Diabetes		21/79	
Stroke		9/91	
COPD		4/96	

1. Lifetime cost divided by remaining years of life after stroke

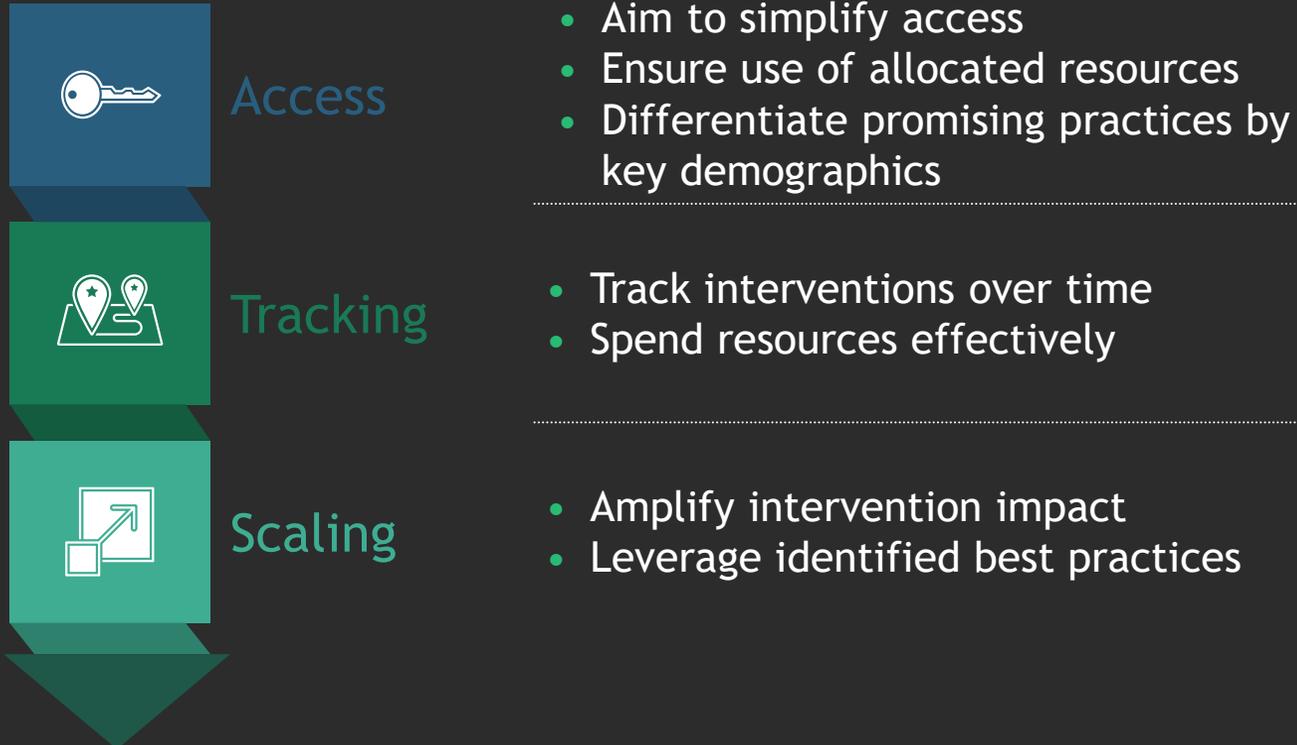
2. This is an overall health expense figure; we assume the ratio is the same for just expenses related to the condition

3. Take out-of-pocket cost from KFF as a portion of total cost from CCDW (this is an overall health expense figure; we assume the ratio is the same for just expenses related to disease)

Promising Practices

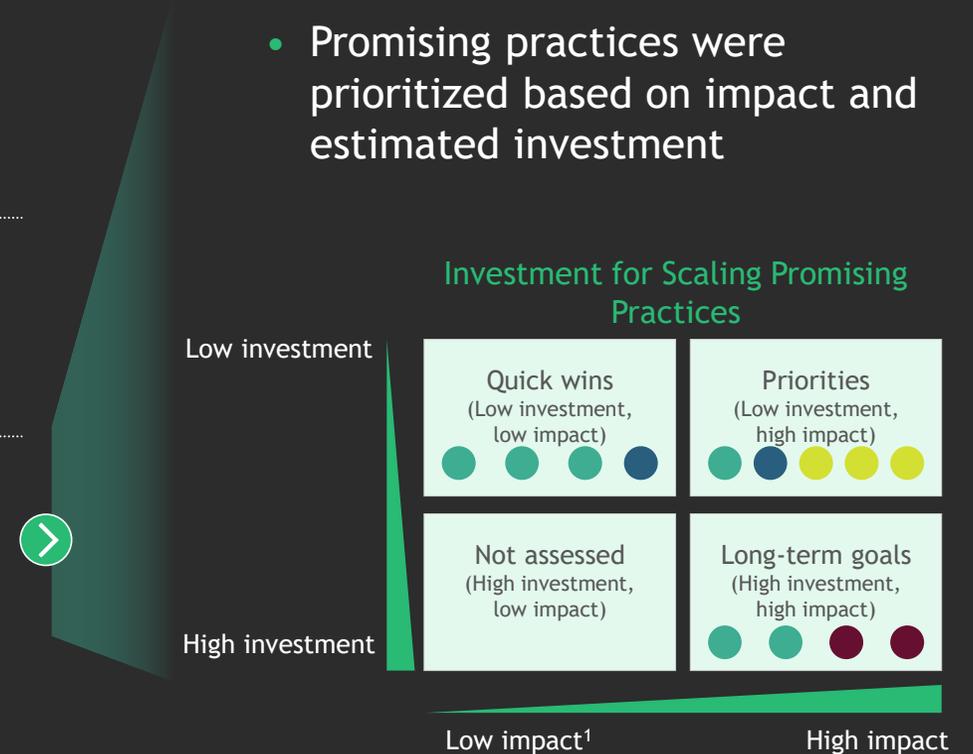
Of three identified pillars, access and tracking are foundational to effectively tackle food insecurity

Each pillar "unlocks" the next



Methodology to prioritize

- Promising practices were prioritized based on impact and estimated investment



1. Daily impact on lives of food insecure population

Methodology - Investment to scale promising practices

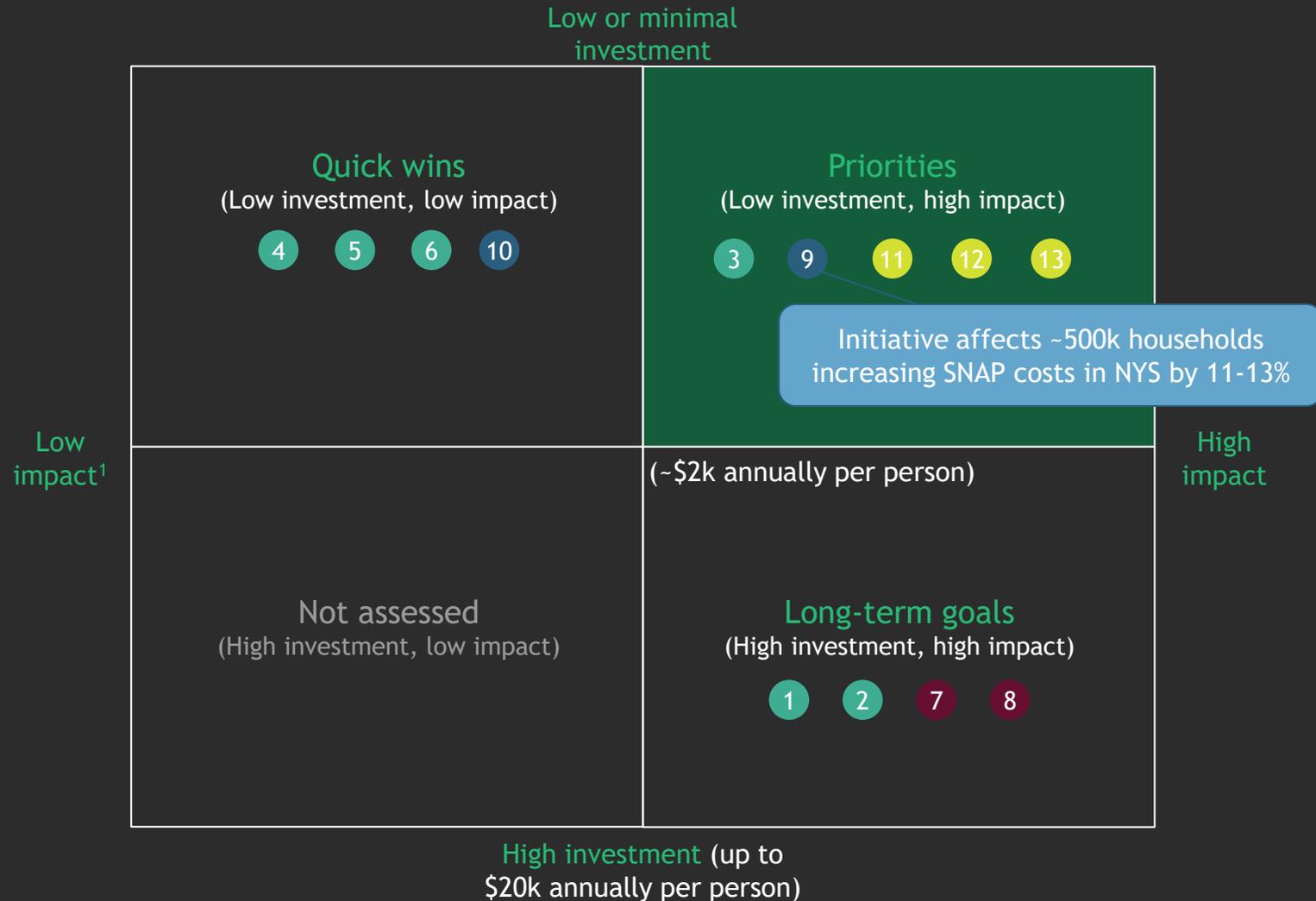
Focusing on scaling promising practices for investment analysis

- Access and tracking pillars are baseline requirements to enable the successful scaling of promising practices
- Tracking requires a top-to-bottom rework that involves coordination between providers, CBOs, government, and payers
 - Integrated nature makes differentiating costs likely inaccurate

Scaling investment methodology

- Estimated relative investment, based on assumptions, to understand comparative size of promising practices
- Low investment promising practices under \$2k per person per year
- High investment promising practices range from \$2k-20k per person per year
- Assessed impact based on promising practice's tangible effect on food insecure population

Partnering with government and retailers shows highest potential immediate impact on food insecure population



Who invests

Providers/Payers

- 1 Expand prevention interventions (e.g., paying livable wage, housing subsidies)
- 2 Prescribe food for patients to pick up specific items from grocery stores
- 3 Fund organizations addressing socioeconomic factors of food insecurity
- 4 Working group to collect and highlight intervention results
- 5 Study root causes of food insecurity
- 6 Publish results of interventions

CBOs

- 7 Online requests for emergency food
- 8 Mobile food pantries to food swamps/deserts

Government

- 9 Advocate for increased government support for food insecurity
- 10 Publish required SDoH reports by VBP contractors

Retailers

- 11 Grocery retailer rebates for SNAP recipients
- 12 Leverage health systems purchasing power to negotiate lower food prices
- 13 Assist grocery stores in accepting SNAP

1. Daily impact on lives of food insecure population

Innovation

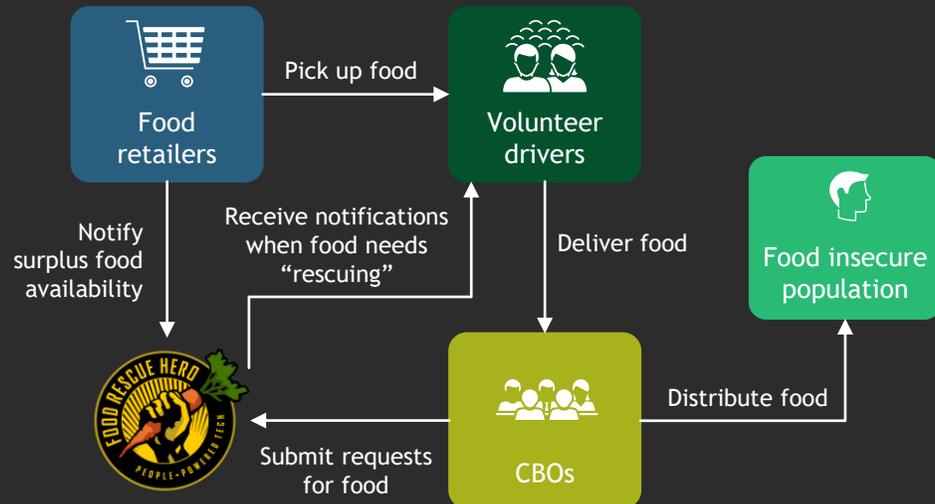
Leveraging surplus food to target food insecurity is promising...

~20M+ pounds of food to be redirected in 2021¹



90% of recipients report improved food security

Food Rescue Hero app solves the logistics problem of surplus food by connecting volunteers, food retailers, and CBOs



1. Triangulated based on pounds of food redirected from 2015-2020, 2021 to date, and monthly estimates

and can be brought to and optimized in NYS

1 Initiate...

Food Rescue Hero in NYC and other NYS cities

2 Evolve...

partnerships with ride-share companies to expand reach and decrease volunteer reliance

direct access for food insecure individuals to pick up surplus food within a certain radius (e.g., notification through specialized app)

Logistics and Grocery potential "unlocks" to food security



Amazon

Currently

Delivered 12M+ meals in 25 cities to "vulnerable families" since March 2020 in partnership with food banks

Potential evolutions

Donate percent of Whole Foods/Prime Now deliveries in-kind to food insecure households

Enable FI individuals to pick up certain items from 24/7 Amazon Go stores for constant emergency food access



Ride-share companies

Currently

Uber committed ~\$1M in two-year partnership with Feeding America for free rides to food pantries and food delivery

Potential evolutions

Strive to increase the portion of total rides or meal deliveries donated to food insecure population (In some instances, ~0.01% of US total revenue)



Grocery retailers

Currently

Contributes surplus food to CBOs through Feeding America, Food Rescue Hero, and to stock community fridges

Potential evolutions

In-store rebates to SNAP beneficiaries to increase effective purchasing power