

# Food Insecurity and Health: A Brief Review of Why Addressing it and Naming it Matters

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# Disclosures

- **Who I am:**

- A former farmer
- Rural Family Nurse Practitioner
- HSA Regional Clinical Representative for OneCare, Vermont's ACO
- Pediatric Faculty at the Larner College of Medicine
- Doctoral Student at the Yale School of Nursing
- Terminologist and coding nerd

- **What I am not: a certified coder**

- **Funders/Friends:**

- Children's HealthWatch
- The Food Research and Action Coalition
- The Root Cause Coalition
- SIREN
- Jonas Philanthropies
- The UVM Larner College of Medicine



# Contents

- A review of relevant policy and process
- Definitions of food security and insecurity including a review of screening tools
- A brief discussion of the literature
- Why naming matters- terminology development for the social determinants
- The Gravity Project
- Diagnostic criteria
- Ethics and Evidence

# Addressing Whole Health Requires Addressing Food Insecurity

- **Academy of Nutrition and Dietetics** "Position of the Academy of Nutrition and Dietetics: Food Insecurity in the United States" (2017)
- **American Academy of Family Physicians**  
"The Everyone Project" (AAFP, 2018)
- **American Academy of Pediatrics**  
"Promoting Food Security for All Children" (2015)  
"Bright Futures Guidelines, 4<sup>th</sup> Ed" (Hagan, & Shaw, 2017)  
"Addressing Food Insecurity: A Toolkit for Pediatricians" (AAP, FRAC, 2017)



# Food Insecurity- Definitions and Tools

- **Common definition** “An economic and social condition of limited or uncertain access to adequate food for an active, healthy life” (United States Department of Agriculture, 2017)
- **Operational definition**
  - Gold Standard Screen- US Household Food Security Survey Module
    - Conducted as part of the yearly Current Population Survey
    - 18 and 6-item surveys
    - Contains concepts of household food insecurity, child food insecurity and food insecurity with hunger
    - “Often true, sometimes true, never true” answers allow for measurement of depth

# Definitions and Tools Cont.

- **Hunger Vital Sign™** ✓
  - First 2 questions of the USDA module
  - Screen of food insecurity risk or marginal food insecurity
  - *Risk of food insecurity only because of lack of measurement of quality, variety, and quantity*
  - The only non-USDA validated screen that includes concepts of food worry *and* food access
  - *Equivalent answers to USDA allow for measure of depth*
  - *Does not contain elements of hunger or child experiences of food insecurity.* (Hager et al., 2010)
- **SEEK** ✓
  - First question of USDA but with “Yes/No” answers
  - Validated but low sensitivity (Lane et al. 2014)
- **Kleinman et al.** ✓
  - “In the past month, was there any day when you or anyone went hungry because you did not have enough money for food?” *Yes, No* (Kleinman et al, 2007)
- **PRAPARE**
  - “In the past year, have you or any family members you live with been unable to get any of the following when it was really needed?”
    - > Food ? > Yes/No” (NACHC, 2018)

# USDA Modules Compared to the Hunger Vital Sign

Adult and Household Questions	USDA/ HVS	Food Security/ Food Insecurity Severity
“We worried whether our food would run out before we got money to buy more.” Was that often, sometimes, or never true for you in the last 12 months?	USDA-18/ USDA- HVS	<i>Food Secure: 0-2 Questions Affirmed</i>
“The food that we bought just didn’t last and we didn’t have money to get more.” Was that often, sometimes, or never true for you in the last 12 months?	USDA/ HVS	<i>Marginal Food Security and Risk for Food Insecurity: 1-2 Questions Affirmed</i>
“We couldn’t afford to eat balanced meals.” Was that often, sometimes, or never true for you in the last 12 months?	USDA	<i>Food Insecurity: 3+ Of Any Questions Affirmed</i>



# Food Security/Food Insecurity Continuum

The food security status of each household lies along a continuum from high food security to very low food security. Lack of access is, in all cases, due to lack of monetary resources or the inability to afford adequate food. The food security continuum is characterized as follows: (Gregory & Coleman-Jensen, 2017)

Two-category food security status:	Food secure		Food insecure	
Four-category food security status:	<b>High food security</b> —Households had no problems or anxiety about consistently accessing adequate food.	<b>Marginal food security</b> —Households had problems, at times, or anxiety about acquiring adequate food, but the quality, variety, and quantity of their food intake were not substantially reduced.	<b>Low food security</b> —At times during the year, households reduced the quality, variety, and desirability of their diets due to a lack of resources for food, but the quantity of food intake and normal eating patterns were not substantially disrupted.	<b>Very low food security</b> —At times during the year, eating patterns of one or more household members were disrupted and food intake reduced because the household lacked money and other resources for food.
Severity of food insecurity	Less severe -----> More severe			

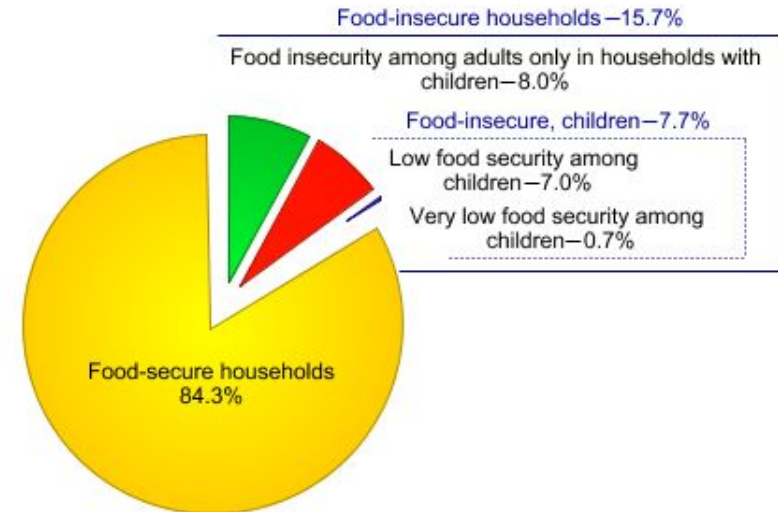


# The Literature- Prevalence

## *“Household Food Insecurity in the United States in 2017”*

- All households – 11.8%
- Households with Children- 15.7%
  - Adults Only – 8.0%
  - Adults and Children – 7.7%
    - **2.9 million households**
- Ethnic Variations
  - White – 8.8%
  - African American- 21.8%
  - Hispanic- 18.0%
- Single parent
  - Female Single Parent- 30.3%
  - Male Single Parent- 19.7%

U.S. households with children by food security status of adults and children, 2017



Note: In most instances, when children are food insecure, the adults in the household are also food insecure.

Source: USDA, Economic Research Service, using data from the December 2017 Current Population Survey Food Security Supplement.

(Coleman-Jensen, Rabbitt, Gregory, Singh, 2018)

# Associated Health Risks

- **Increased rates of each of the CDC diseases of concern:**
  - Hepatitis ▲ Stroke ▲ Cancer ▲ Asthma ▲ Arthritis ▲ Coronary heart disease ▲ Hypertension ▲ Chronic obstructive pulmonary disease (COPD) ▲ Chronic kidney disease ▲ Diabetes and diabetes poor control

(Berkowitz, Baggett, Wexler, Huskey, & Wee, 2013; Gregory, Coleman-Jensen, 2017; Seligman, Laria, & Kushel, 2010)
- Increasing depth of food insecurity only strengthens the association  
(Gregory, Coleman-Jensen, 2017)
- Persistent when poverty was controlled for (Gregory, Coleman-Jensen, 2017)

# Associated Health Risks Cont.

- **Increased child developmental risk** (Cook et al., 2013; Rose-Jacobs, et al. 2008)
- **Poorer self/caregiver reported health for all ages** (Alvarez, Lantz, Sharac, & Shin, 2015; Brucker, 2017; Chilton et al., 2009; Cook et al., 2013; Jeong-Hee, Bartfield, 2012; Cook et al., 2004)
- **Depression**
  - Increased depression in children, adolescents and women (Alaimo et al., 2001; Belsky et al., 2010; Cook et al., 2004; Olson, 2005; Whitaker, Phillips, & Orzol, 2006)
  - Increased suicidality and “desire to die” in adolescents (Alaimo, et al., 2001; Alaimo, et al., 2002; McIntyre, et al., 2013)
- **Mood and anxiety disorders-** increased rates for mother and adolescents (Alaimo et al., 2001; Belsky et al., 2010; McLaughlin, et al., 2012; Whitaker, Phillips, & Orzol, 2006)
- **Psychological distress-** Increased rates of moderate-severe psychological distress related to severity of food insecurity in US Hispanic and African American adults (Allen, B. Bacerra, & M. Bacerra, 2017; B. Bacerra, Sis-Medina, Reyes, M. Bacerra, 2015)

# Associated Health Risks Cont.

- **Decreased health care access**

- Under or no insurance
- Decreased preventative/ambulatory care
- Postponing care
- Postponing medications/cost-related medication underuse

(Baer, et al., 2015; Berkowitz, Seligman, & Choudry, 2014; Herman, Afulani, Coleman-Jensen, & Harrison, 2015; Kushel, Gupta, Gee, & Haas, 2005; Ma, Gee, & Kushel, 2008; )

- **Increased acute care in adults** (Kushel, Gupta, Gee, & Haas, 2005)

# Utilization

- **Increased Utilization**

- Increased ED visits and increased hospitalization. (Baer, Scherer, Fleegler, & Hassan, 2015; Brucker, 2016; Cook et al., 2013; Cook et al., 2004; Kushel, Gupta, Gee, & Haas, 2005; Ma, Gee, & Kushel, 2008; )

- **Increase total cost of care**

- Estimated increased health care costs attributed to food insecurity

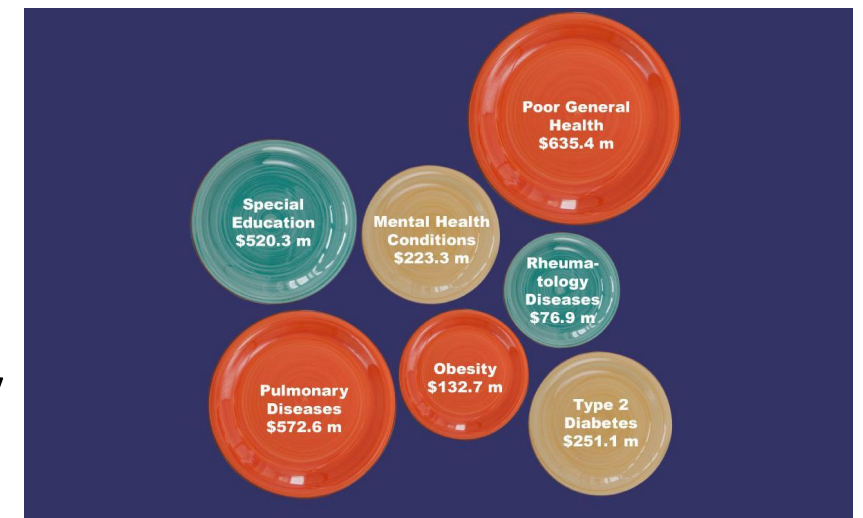
- \$1,863/year per person
- \$77.5 billion/year US  
(Berkowitz, Basu, Meigs, & Seligman, 2017)

- Estimated US total costs related to food insecurity

- \$160.7 billion (Cook, & Poblacion, 2016)

- Estimated cost for Massachusetts alone 2.4 billion

<http://www.macostofhunger.org> (Cook & Poblacion, 2018)



The food security status of the families we serve matters  
This is clear...

So what if it is hidden from our documentation, our referrals,  
our orders, our risk analysis, and our research

Enter why a former farmer became a terminologist





# Social determinant terminology development

- As care for social needs has advanced in the medical space there is an increasing demand to expand the terminology (language) for social needs
  - To better care for patients with social needs and the populations they live within
  - Share care with clinical and community partners
  - Study the effects of our interventions
  - Demonstrate/study social needs and their effect on health outcomes
  - Allocate resources toward social risk within value based care



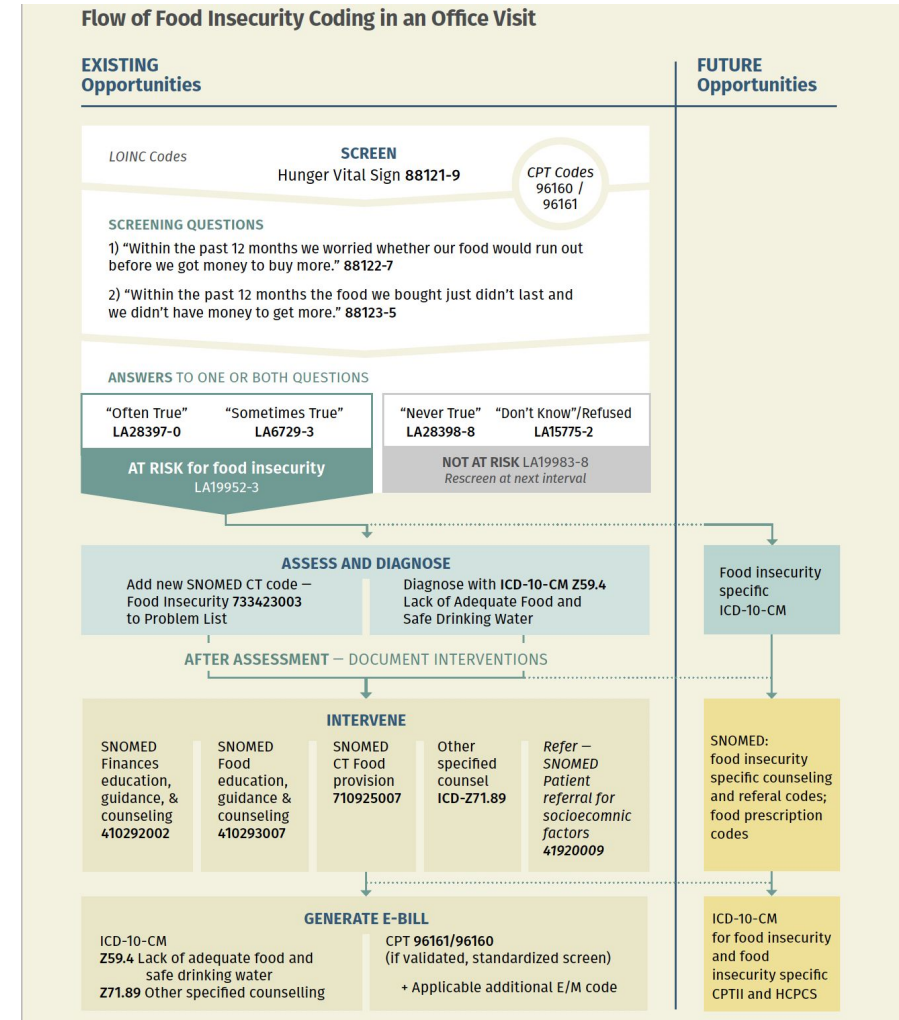
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# An Overview of Food Insecurity Coding in Healthcare Settings: Existing and Emerging Opportunities

(DeSilvey et al, 2018)

- 2017-2018
- FRAC, Children’s Healthwatch, SIREN
- Outcomes:
  - \*LOINC build for the HVS™
  - Expanded CPT coverage for validated food insecurity screening
    - 96160 and 96161
  - SNOMED (problem list) code for food insecurity
  - Gap awareness...



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# Improving the Interoperability of Social Determinants of Health Data in Electronic Health Records

- November 9<sup>th</sup>, 2017
- SIREN, CDC, Health Leads, LOINC, CMMI, ONC, SNOMED, Kaiser, OCHIN, Children's Health Watch, RWJF, (and many more)
- Outcomes:
  - In some cases there are too many codes
  - In some cases there are not enough
  - It is difficult to build codes when we are still refining concepts
  - Of the common concepts, food insecurity is one of the most mature (common conceptual and operational definitions)



# White Paper/ Compendium

- “Documenting Social Determinant of Health-Related Clinical Activities with Standardized Clinical Vocabularies” published 12/2018 in JAMIA Open
- “Compendium of Medical Terminology Codes for Social Risk Factors”  
<https://sirenetwork.ucsf.edu/tools-resources/mmi/compendium-medical-terminology-codes-social-risk-factors>
- All with Abigail Arons, Caroline Fichtenberg, and Laura Gottlieb of SIREN



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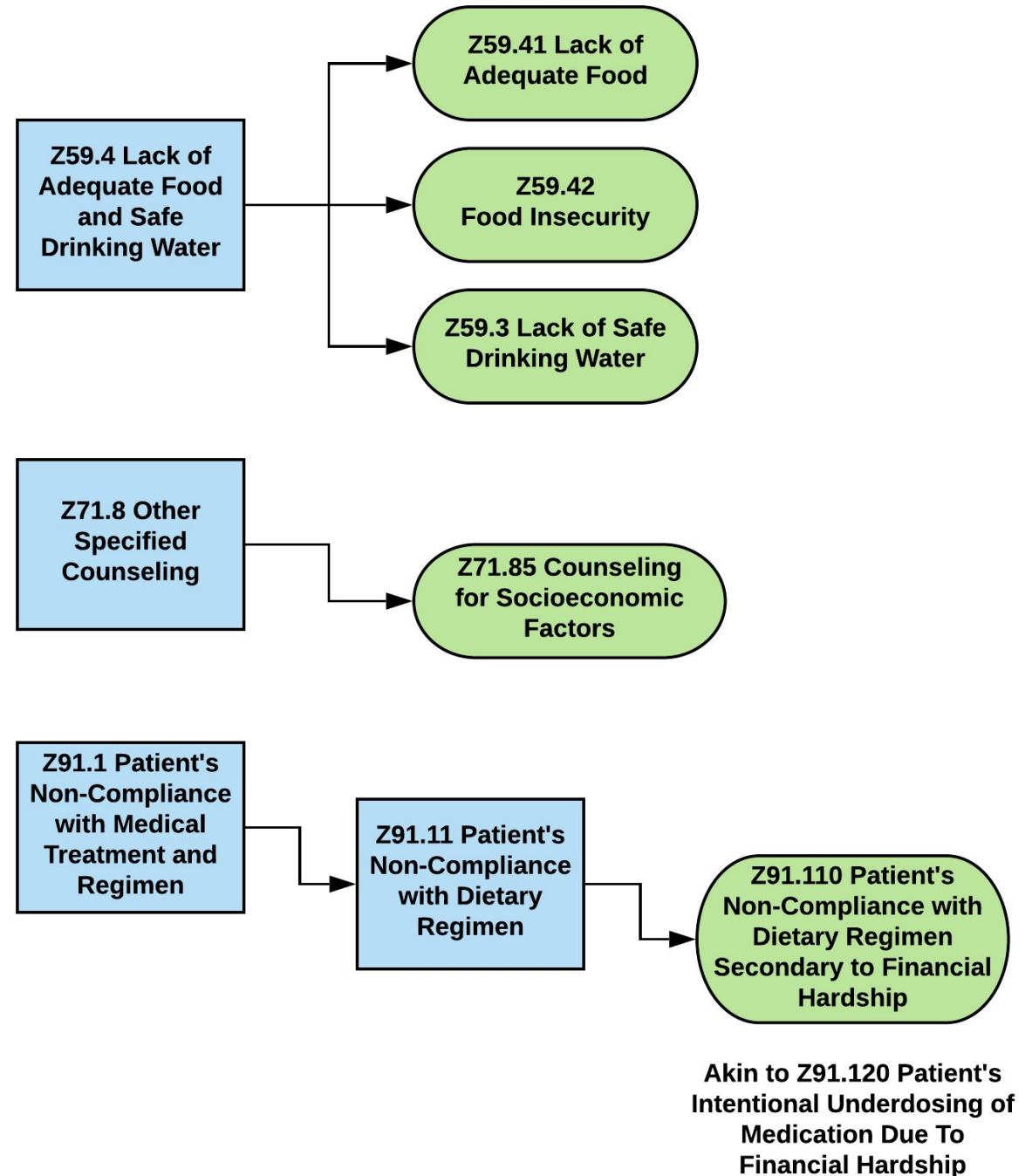
# Concern 1- Food Insecurity Diagnostic Terminology Gaps

- Current State: “Z59.4 Lack of Adequate Food and Safe Drinking Water”
  - Groups lack of food and water resources together thus discretely identifying neither
  - Does not contain the economic drivers of FI
- Diagnostic Terminology- ICD-10-CM
  - The language of diagnoses and causation in claims:
    - Billing, defining causation for orders and referrals, claims based research, population health analysis, and risk assessment
  - International- WHO
  - US- CDC > NCHS



# ICD-10-CM Application

- Build specific codes for lack of food, food insecurity, and lack of water
- Build new code for counseling for socioeconomic factors
- Build new code for financial hardships effect on prescribed dietary regimens





# Diagnostic Language Build- ICD-10-CM Application

- Sponsored by Vermont BCBS (CHW and I worked with them on CPT expansion)
- Application crafted in consult with coding experts from AHIMA (Thank you Kathy Giannangelo)
- Application heard at the 3/6 ICD-10-CM Coordination and Maintenance Committee Meeting
  - <https://www.cdc.gov/nchs/data/icd/Topic-packet-March-2019-Part-2Vs3.pdf>



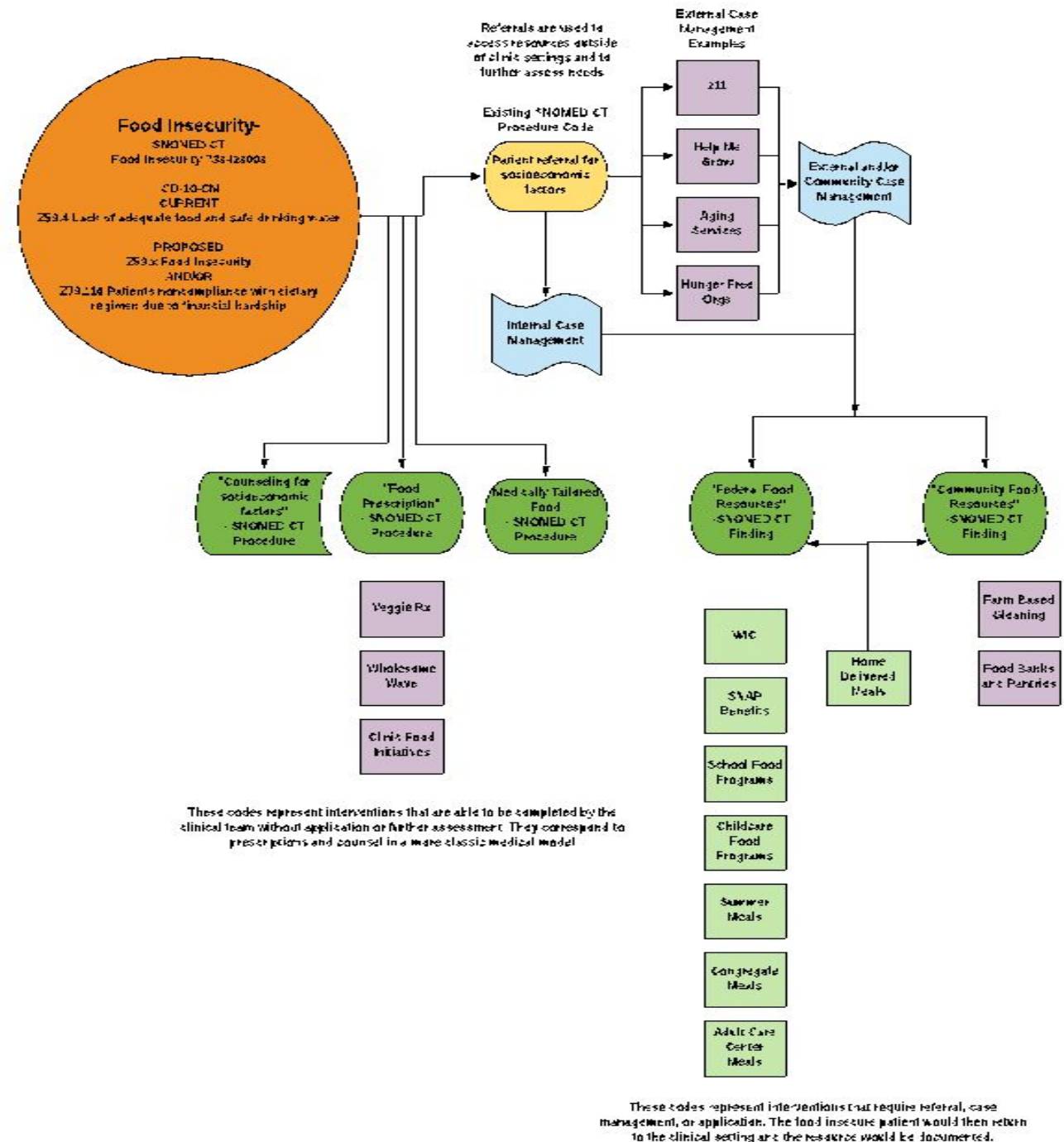
# Concern 2- Food Insecurity Intervention Language Gaps

- "How can we document FI resources?"
  - To document orders to address FI in clinical settings
  - To document the resources that protect low-income families and individuals from FI
  - To study the effect of our interventions across settings
- SNOMED (Systematized Nomenclature of Medicine)
  - Language of the problem list, past medical and social history, non-pharmacologic orders, environment, etc... (vast)
  - Perfect for interventions not captured by alternate terminology sets (non-pharm)
  - SNOMED International/NLM



# Likely Intervention Language Build

- Aim is to build priority terms
  - Food Prescription
  - WIC
  - SNAP
  - FDIPR
  - Home-Delivered Meals
  - Congregate Meals
  - Medically Tailored Meals
  - National School Lunch Program
  - Summer Meals
- And if this seems too far afield – know there is a SNOMED term for “taco”



# The Gravity Project

- **This work has been folded into the aims of The Gravity Project, a SIREN led and Robert Wood Johnson funded year long initiative to...**
  - Develop use cases related to documenting social risk and protective factors data on screening, diagnosis, treatment, and population health management activities;
  - Identify common data elements and their associated value sets to support the uses cases;
  - Develop a consensus-based set of code recommendations for capturing and grouping these data elements for interoperable electronic exchange and aggregation; and
  - Initiate an HL7<sup>®</sup> Fast Health Interoperability Resource (FHIR<sup>®</sup>) Implementation Guide based on the defined use cases and associated data sets.



# The Gravity Project

- **Concepts Addressed**

- Food security;
- Housing stability and quality; and
- Transportation access.

- I lead the food insecurity segment with the American Academy of Nutrition and Dietetics

- **Please join!!**

<https://confluence.hl7.org/display/PC/The+Gravity+Project+Home>



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# Segue to ontology

- We have discussed (what I call) the carpentry of the work...
  - Build these things and use them
- Now we are going to transition a bit to discuss the more philosophical branch of this work...



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# Concern 3- FI Diagnostic Considerations

- Current FI assessment in clinical practice relies principally upon the use of screeners - validated and non-validated
  - US 6 and 18-time food security modules (USDA, 2017)
  - Hunger Vital Sign™ (Hager et al, 2010)
    - Imbedded into the AHC tool, Everyone Tool, AAP toolkit
  - PRAPARE (NACH, 2017)
  - SEEK Parent Questionnaire (Dubowitz, 2014)
  - We Care (Garg et al, 2007)
  - And many more!



# FI Diagnostic Considerations

- There are limitations to this though
  - What if a setting does not have an employed screener? How can you ascertain food insecurity based on reported history alone?
    - “We have been having a really hard time lately. We cannot afford food because rent has to get paid and heat cost have been crazy this year because of the cold. The kids luckily eat good food at school. I give them what I can. But, most days I don’t have dinner.”
  - Lack of validation can create concerns about equivalence
  - Conceptual limitations even in the presence of validation
    - A positive result of the Hunger Vital Sign™, is equivalent to “marginal food security” according to the 18-item screen
      - = “risk for food insecurity”
      - Limits in assessing FI effect on food quantity, variety, and quality (Hager et al, 2010)



# Diagnostic Process

- In practice clinicians use diagnostic criteria to ground all of these possible concerns
- Diagnostic criteria are sets of discrete or verbal data that define the core concepts inherent in a condition
- Clinicians weigh the data in patient interview, vital signs, labs and orders, against these criteria to come up with a diagnosis that is equivalent across settings and “independent of the observer”(NAM, 2015)
- Examples:
  - Discrete- Diabetes:  $FPG \geq 126\text{mg/dl}$  and/or  $A1C \geq \%6.5$  and/or  $RPG \geq 200\text{mg/dl}$  and/or 2-h  $PG \geq 200\text{mg/dl}$  (American Diabetes Association, 2019)
  - History Based- IBS: Recurrent abdominal pain or discomfort at least 3 days/month in the last 3 months associated with two or more of the following: Improvement with defecation; Onset associated with a change in frequency of stool; Onset associated with a change in form (appearance) of stool
    - Criterion fulfilled for the last 3 months with symptom onset at least 6 months prior to diagnosis (Mostafa, 2008)



*What would a diagnostic criteria for food insecurity look like?*

*What considerations do we have to bear in mind?*



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# First Steps: Before Criteria, Come Considerations

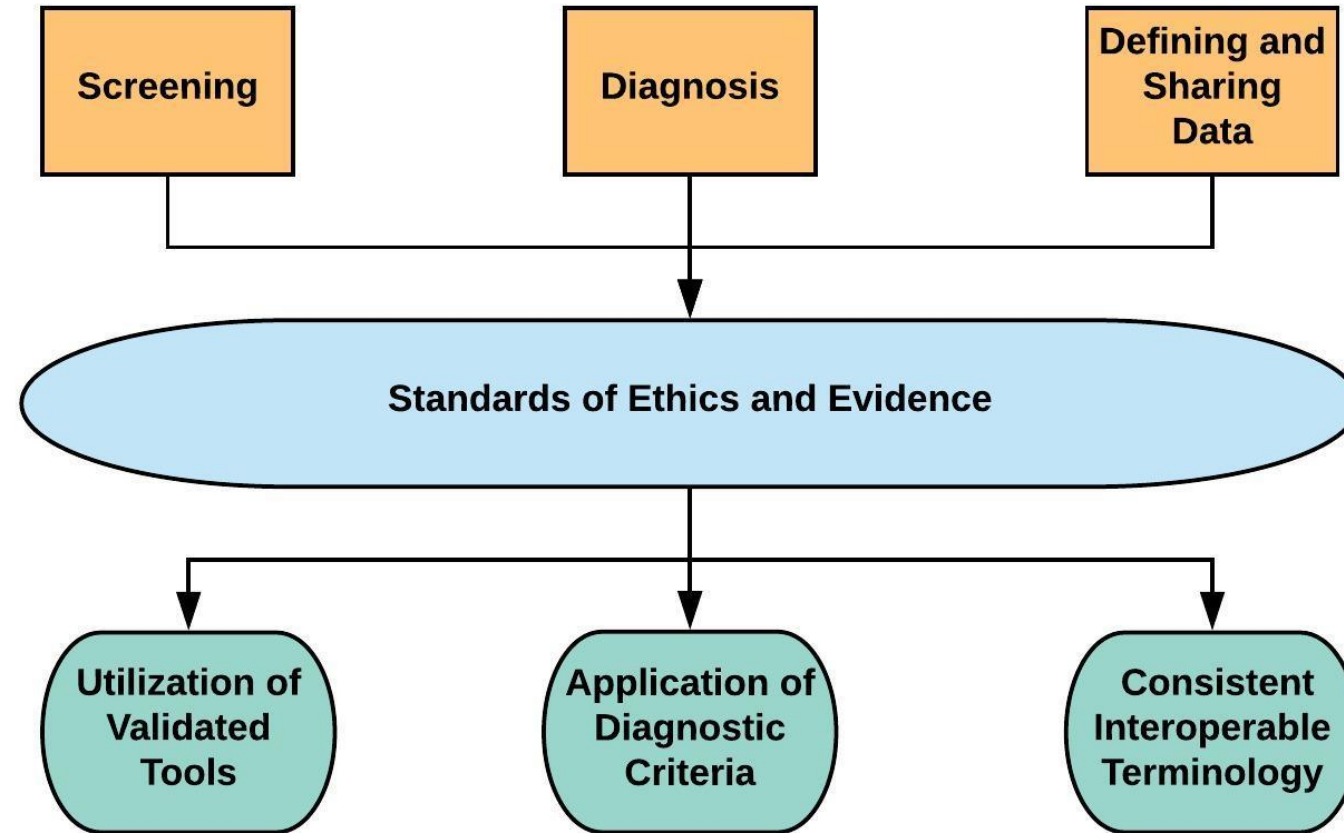
- Joint work with the USDA ERS, the AND, FRAC, CHW, FI researchers...
- Considerations
  - **Critical Concepts:** Lack of adequate food driven by low economic resources
    - In many ways the easiest part
  - **Time:**
    - Does the variable of time change when you change the delivery of the screener?
      - The food security module was crafted as a December calendar year look back
      - Is 12 months the appropriate duration?
      - Does it change when being administered regularly in clinical settings?
    - Do we even need a time element?
      - Does it change when you consider we screen to look forward and address instead of look backward and measure? (C. Gregory, USDA)
  - **Acuity, chronicity and cycles**
  - **Severity and Depth**



# Diagnostic Considerations

- The hope is that over the next few months we will at least flesh out the considerations fully...
  - Are there others?
- Then we hope to publish them to inspire further conversation
- Eventually, a gathering of minds would be in order to develop a criteria from these considerations by consensus

# Ethics and Evidence



***Thank you!***





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