

# Relevance of Food Insecurity to the CDC's Diabetes Agenda

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## BACKGROUND

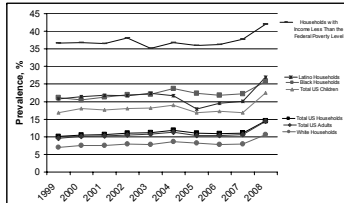
Food insecurity is the inability to reliably afford food. It exists whenever "the availability of nutritionally adequate and safe foods, or the ability to acquire acceptable foods in socially acceptable ways, is limited or uncertain".

In 2008, 14.6% of U.S. households and more than 49 million individuals were food insecure.

Risk factors for food insecurity include:

- African-American/Latino households
- Households with children
- Low-income households

## Food Insecurity Rates Are Rising

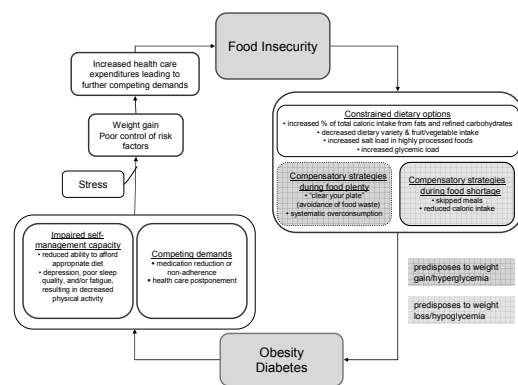


## OBJECTIVE

Review studies addressing food insecurity to determine food insecurity's implications for:

- diabetes risk
- diabetes self-management.

## CONCEPTUAL MODEL



To maintain caloric intake within limited food budgets, food insecure adults shift dietary intake toward inexpensive, energy-dense foods (refined carbohydrates, added sugars/fats) and away from expensive fruits and vegetables. They also overconsume during food adequacy in anticipation of future food shortage. These behaviors may predispose to the development of obesity and diabetes.

Food insecure adults with diabetes may have reduced self-management capacity (eg reduced ability to afford diabetes-appropriate foods) and competing demands for purchasing medications.

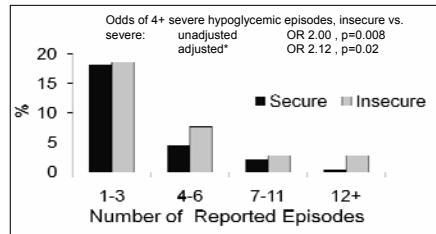
Resulting weight gain and poor risk factor control may increase diabetes complications and health care expenditures, thus exacerbating food insecurity.

## Food Insecurity Is Associated with Increased Diabetes Risk

Study	Population	n	Diabetes Definition	Risk of Diabetes, 95% CI (Insec vs Sec)
Vozoris, 2003	Canadian National Public Health Survey	81,581	Self-report	Adjusted OR 1.8 (1.2-2.6)
Holben, 2006	Appalachian Ohio	808	HbA1c > 7%	33.9% vs 22.5%, unadjusted p=0.05
Seligman, 2007	NHANES, 1999-2002	4423	Self-report	Adjusted OR 2.1 (1.1-4.0)
Stuff, 2007	Lower Mississippi River Delta	1457	Self-report	15.0% vs 9.3%, unadjusted p=0.03
Gucciardi, 2009	Canadian Community Health Survey, Ontario only	6237	Self-report	Unadjusted 9.3% (8.2-10.4%) vs 6.8% (6.5-7.0%)
Seligman, 2010	NHANES, 1999-2004	5094	Self-report or FBS ≥ 126	Adjusted OR 2.4 (1.4-4.1)

All studies are cross-sectional.

## Food Insecurity Increases Frequency of Severe Hypoglycemic Episodes Among Adults with Diabetes



\*Adjusted model includes sociodemographic characteristics and other known risk factors for hypoglycemia. Seligman, unpublished data.

## Food Insecurity Impairs Glycemic Control Among Adults with Diabetes

	Recruitment site, n	Mean HbA1c (Insecure vs. Secure), unadj p
Seligman, 2010	NHANES, 1999-2004, n=5094	8.1% vs. 7.4%, p=0.09
Seligman, in press	Safety net clinics in Chicago and Louisiana, n=37	9.1% vs 7.7%, p=0.08
Seligman, unpublished	Safety net clinics in Chicago and San Francisco (n=711)	8.5% vs 8.1%, p=0.007

## Food Insecurity Forces Trade-Offs Between Food and Medication

Among adults with diabetes, those who are food insecure are more likely to put off paying for testing supplies (RR 2.8, p<0.001) and diabetes medications (RR 2.2, p=0.01) to have enough money for food; they are also more likely to put off buying food in order to have enough money for testing supplies (RR 2.0, p=0.03) and diabetes medications (RR 2.3, p=0.01). (Seligman, in press)

## CONCLUSIONS: IMPLICATIONS FOR CDC

Risk of diabetes is high among food insecure adults. Among adults with diabetes, food insecurity is a risk factor for frequent episodes of severe hypoglycemia, poor glycemic control, & poor medication adherence. Translation of diabetes interventions into low-income communities must include strategies to insure participants have adequate access to food.



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This poster is available at the Diabetes Information Resource Center (DIRC), [www.caldiabetes.org](http://www.caldiabetes.org)