

OVERVIEW OF HEALTH ISSUES AMONG FARMERS AND FARMWORKERS

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OVERVIEW OF HEALTH ISSUES AMONG FARMERS AND FARMWORKERS

- **History of agricultural health**
- **Mortality in agriculture**
- **Morbidity**
- **Farmer demographics and health**
 - **Respiratory disease**
- **Farmworker demographics**
- **Health status of farm workers**
 - **Acculturation**

THE AGRARIAN MYTH AND AGRICULTURAL HEALTH AND SAFETY

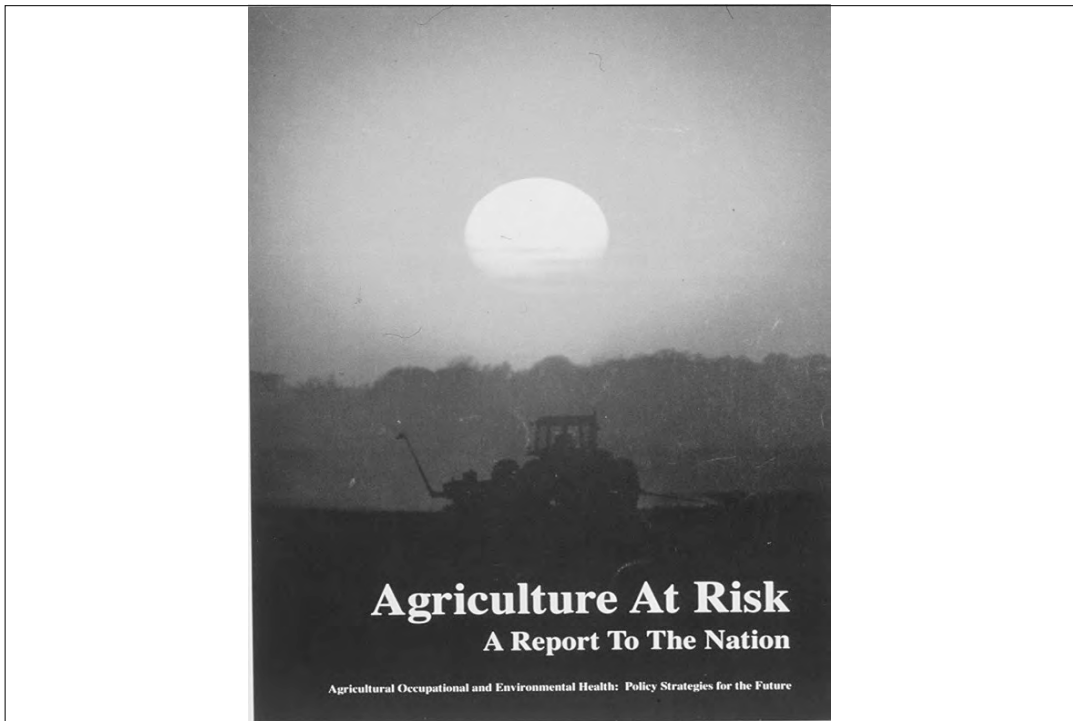
“Cultivators of the earth are the most valuable citizens. They are the most vigorous, the most independent, the most virtuous, and they are tied to their country and wedded to its liberty and interests by the most lasting bonds.”

Thomas Jefferson

THE HAZARDS OF FARMING

“During the past quarter century the hazards of industry, transportation, mining and construction have been recognized. For agriculture...there has been no such recognition, and farming, though the oldest occupation in the world, remains the most hazardous.”

John Powers, J.A.M.A. 133, 1939



CATEGORIES OF OCCUPATIONAL HAZARDS IN AGRICULTURE

PHYSICAL

- Equipment (hand, mechanical), ergonomic, noise, heat, vibration, radiation

CHEMICAL

- Dusts, pesticides, gases, fumes, solvents (fuels)

BIOLOGIC

- Bacteria, fungi, viruses, insects

STRESS

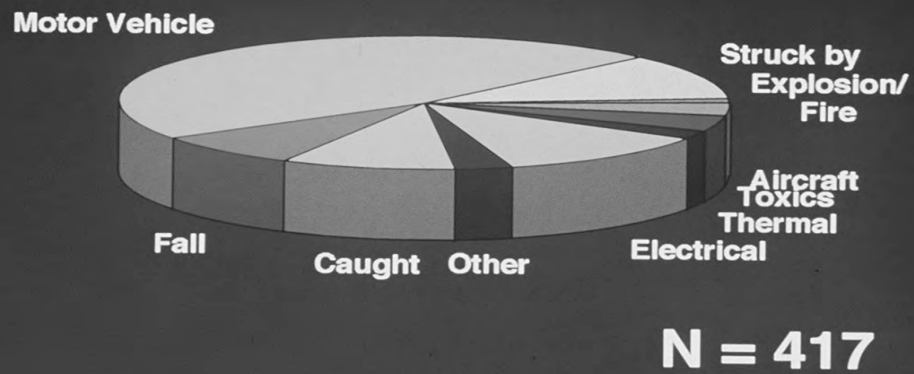
- Physical, chemical, ergonomic, psychosocial induced

California Occupational Mortality, 1979-81: Agriculture, Males

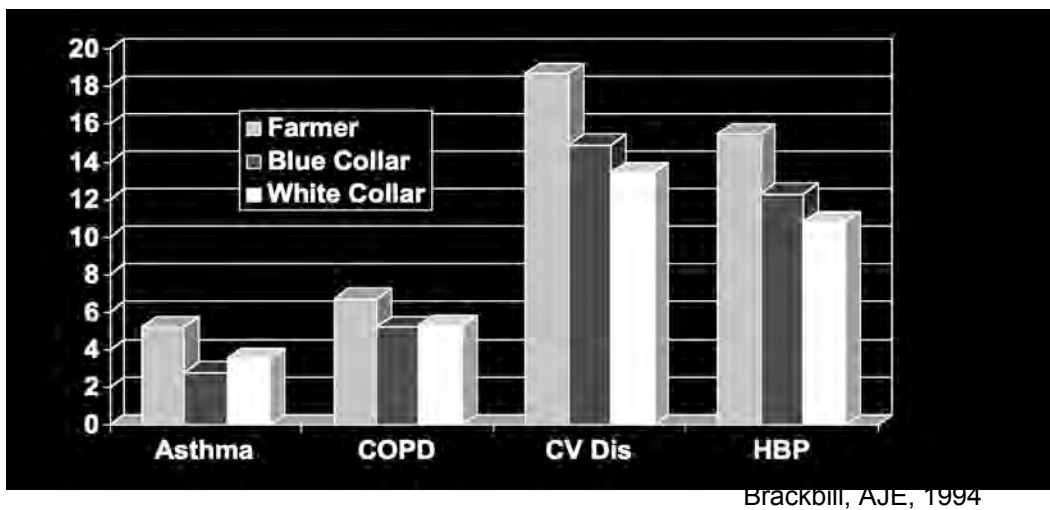
<u>Cause</u>	<u>SMR</u>	<u>95% C.I.</u>
All Causes	139	135 - 143
Falls, machinery	306	249 - 363
Urinary system	182	115 - 250
Cirrhosis	152	133 - 171
COPD	134	106 - 163
Cerebrovascular	128	105 - 151
Lung Cancer	81	69 - 92



Fatal Injuries in Agriculture California, 1981 - 90



Age-Adjusted Prevalences for Chronic Conditions: NHIS, 1986-90



Respiratory Hazards in Agriculture

EXPOSURE

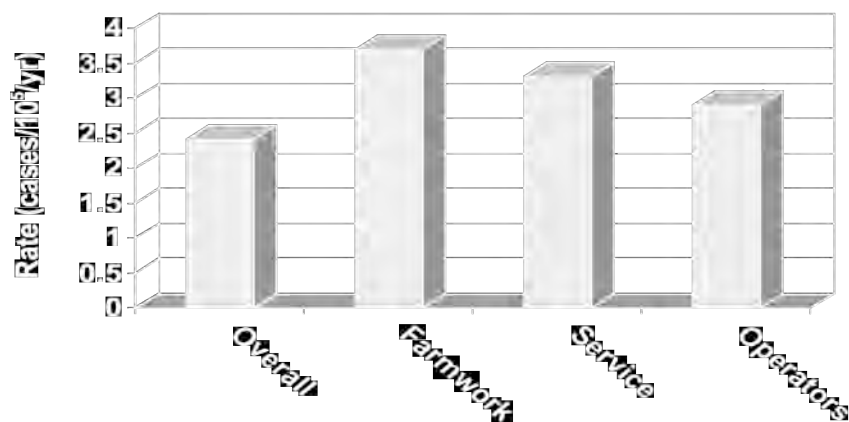
EXAMPLES

- **Organic dusts**
 - **Vegetable** **Grain, hay, cotton**
 - **Animal** **Hair, feathers, skin**
 - **Microbial**
 endotoxin **Bacterial and fungal antigens,**
- **Gases** **H₂S, NH₃, CH₄, CO₂, NO₂**
- **Chemicals** **Paraquat, solvents, fuels, exhausts**
- **Inorganic dust** **Silica, silicates, asbestos**

Examples of Agents in Agriculture Causing Occupational Asthma

- Plant-derived
 - Cereals
 - Grain dust mites
 - Soya bean dust
 - Coffee dust
- Animal-derived
 - Cow dander, urine
- Arthropod-derived
- Other
 - NH₃, NO₂ (high concentrations)
 - Organophosphate pesticides (?)

Occupational Asthma Rates in California Occupations*



*3/93 - 12/99, n = 2343

Relative Risk for Occupational Asthma by Employment

	RR*	95% C.I.
Farm-machine Manufacturers	11.0	1.3-39.6
Coal Mining	7.4	1.5-21.6
Agriculture	3.7	1.4-8.2
Textiles	3.0	0.6-8.9
Bakery	3.0	0.1-16.4
Lumber, wood	1.8	0.2-6.4

*Age and sex adjusted

Blanc, *Chest*, 1987; 92:613

Occupation and smoking adjusted asthma mortality in Swedish men*

<u>OCCUPATION</u>	<u>N</u>	<u>SMR</u>	<u>95%CI</u>
Woodworking	13	226	108-344
Farm workers	21	170	107-235
Farmers	123	137	115-156
Printers	14	137	64-211
Bakers	11	194	87-300

*Deaths 1971-1980; age 20-64 in 1970; ICD 493

Toren, BJIM 1991;48:323

California Agriculture

~80,000 farms

**750,000 - 1,000,000
hired farmworkers**

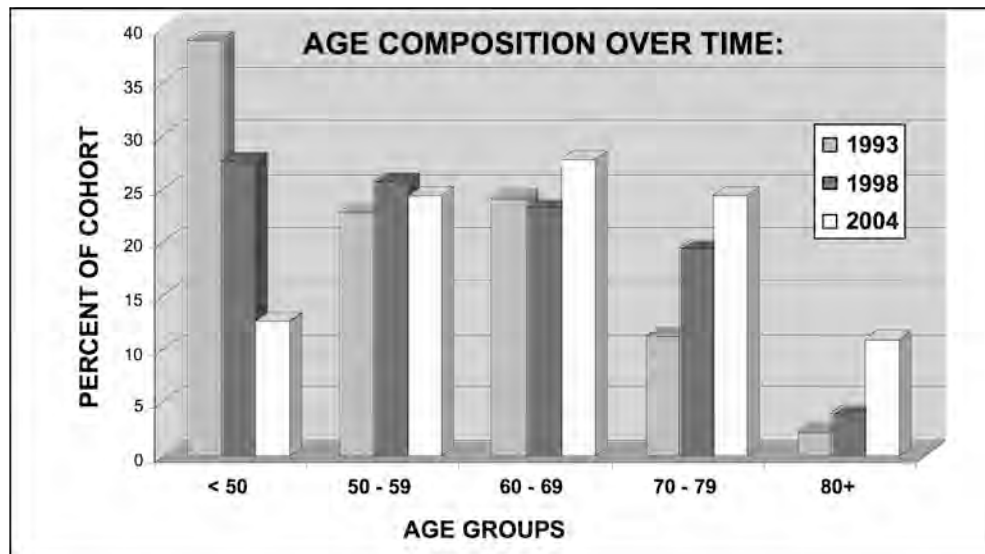
**~50% primary farm
operator**



UC Davis Farmer's Cohort: First Survey 1993

Comparison with USA	1993 FHS	1992 All States
Male	89.9%	92.5%
Female	10.1%	7.5%
Average age	54.5 years	53.3 years
Av. Farm size	1058 acres	462 acres
Racial / Ethnic composition		
White	84.5%	97.6%
Black	0.2%	1.0%
Hispanic (multi race)	6.2%	1.1%
Asian – Pacific Island	4.6%	0.4%
Other	4.5%	1.0%

UC Davis Farmer's Cohort



Percent of California Farmers Reporting Health Condition, by Age in 2004

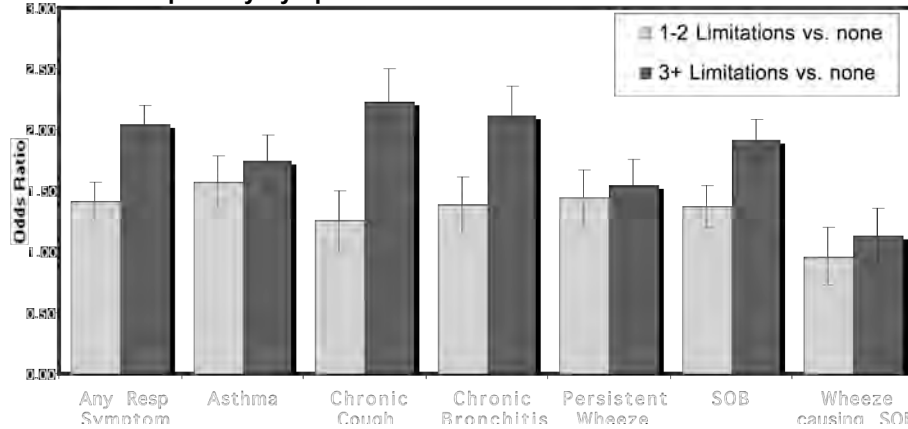
Prevalence	All Ages	<65 y/o	65 - 75 y/o	>75 y/o	p trend
Diabetes	12.2	8.0	16.4	21.7	<0.0001
Stroke	3.6	4.5	4.6	8.1	0.005
Myocardial infarction	8.5	4.2	12.8	15.1	<0.0001
Skin Cancer	19.7	15.2	26.4	24.1	0.001
Other Cancer	12.0	4.0	21.5	22.3	<0.0001

Percent of California Farmers Reporting Work Limitation by Condition

Condition	All Ages	<65 y/o	65 - 75 y/o	>75 y/o	p trend
Heart Disease	6.4	2.5	6.4	17.1	<0.0001
Asthma	11.3	11.5	12.4	9.5	NS
Joint Problem	25.7	23.2	28.7	29.4	NS
Nerve Problems	13.5	13.8	17.8	8.3	NS
Injury	12.0	11.3	13.5	11.8	NS

Number of functional limitations associated with respiratory conditions, 1998

Odds Ratios and 95% Confidence Intervals for Functional Limitations with Respiratory Symptoms in Never Smokers



University of California at Davis Farmer Health Study

- In 1998, injury in the previous 12 months was associated with having a previous injury, exertion level, working with horses, in a workshop or on small farms (adjusted for sex, age, hours worked and education).

<u>Risk Factor</u>	<u>Odds Ratio</u>	<u>95% CI</u>
Medium/high exertion level	4.9	1.4 – 16.0
Previous Injury	4.05	2.7 – 6.2
Small Field Farm	3.0	1.1 – 8.7
Workshop use	1.8	1.1 – 3.1
Work with horses	1.7	1.1 – 2.9

Perception of Farming Hazardousness by California Farmers

- **Comparison to other occupations:**
 - **More hazardous** **10%**
 - **Same** **22%**
 - **Less** **67%**
- **Perceived as more hazardous by high “hands on” farmers.**
- **No difference by gender, prior injury, income from farming or farm size.**

Farrar, Schenker et al, 1995

Cost of Occupational Injuries in Agriculture

- **Estimate based on BLS and NTOF data, 1992**
- **Total cost \$4.57 billion (range \$3.14 - \$13.99)**
 - **Direct** **\$1.66 billion**
 - **Indirect** **\$2.93 billion**
- **Agriculture 1.8% GDP, but 3.5% of occupational injury costs in US**
- **Compare occupational COPD (\$3.9 billion), occ cancer (\$9.4 b), hepatitis C (\$5.46 b)**

Leigh, 2001, Pub Hlth Rpt.

Hired Farm Workers



Farmworker Demographics from National Agricultural Worker Survey

	U.S.	California
Age	31 years	32 years
% Hispanic	71%	91%
% Women	29%	26%

Health of Farm Workers: Job Characteristics, CA -NAWS

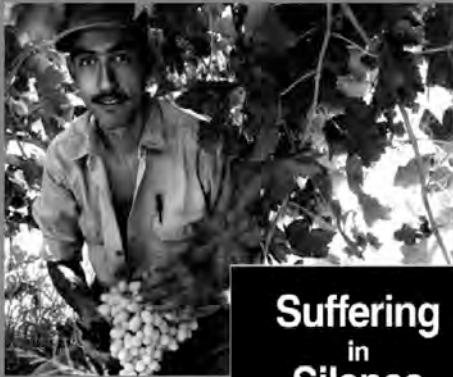
- 51% perform harvesting
 - 86% in fruits, nuts, vegetables
- Average employment 63% of year in agriculture
 - 69% hourly, 22% piece rate
- 17% report no access to water for washing at work
- 9% report no drinking water
- 2% report no toilets

Health of Farm Workers: Economic Status -NAWS

- 50% earn < \$7,500/year
 - Poverty level increases with family size
- 18% receive needs based social services (food stamps most commonly)
- 29% receive income from government programs (unemployment, disability, etc)
- 6% receive aid from private organizations

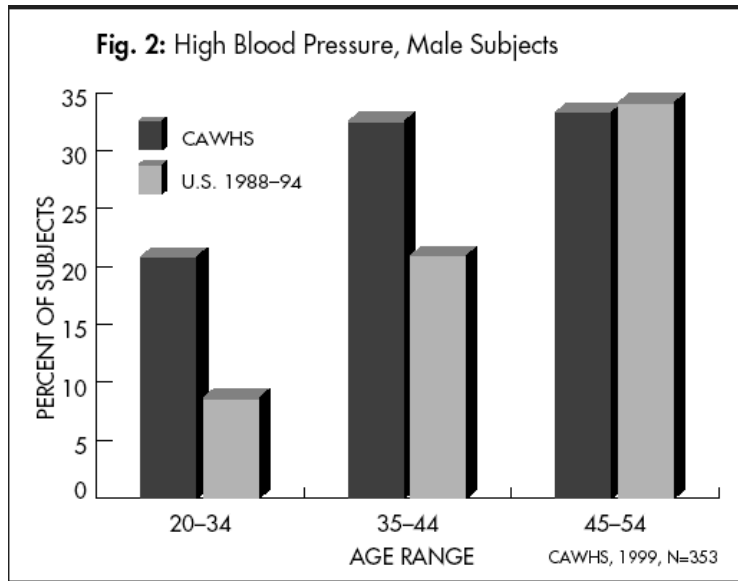
Health of Farm Workers: Socio-Economic Issues

- **“Poverty amid Prosperity”** Taylor J, Martin P, Fix M. Urban Institute Press, 1997.
 - A vicious circle:
 - » ↑ farm work → ↑ immigration → ↑ poverty
 - Fresno County, pop 800,000.
 - » 25% on public assistance
 - » 12% unemployment
 - » \$3.3 billion in farm sales
 - Low income, low education, seasonal work, large household ⇒ \$3700/yr income for recent immigrants

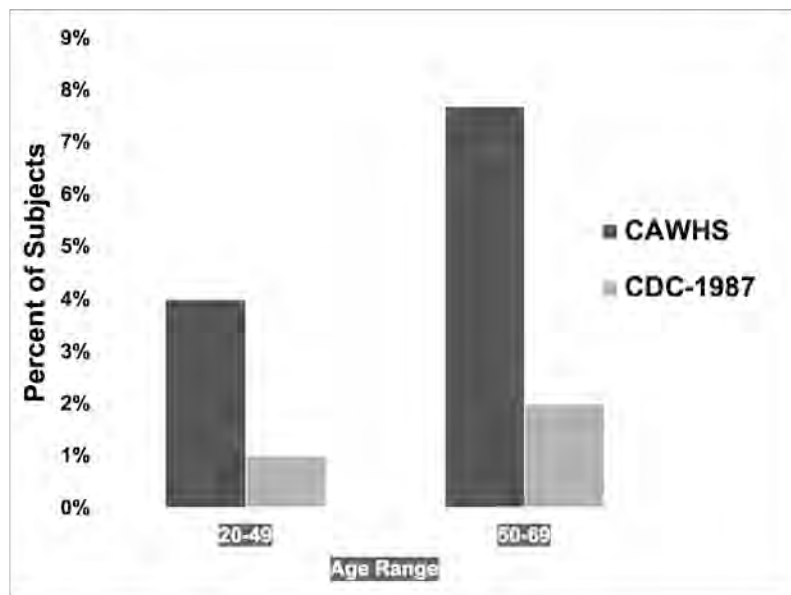


The California Agricultural Workers Health Study

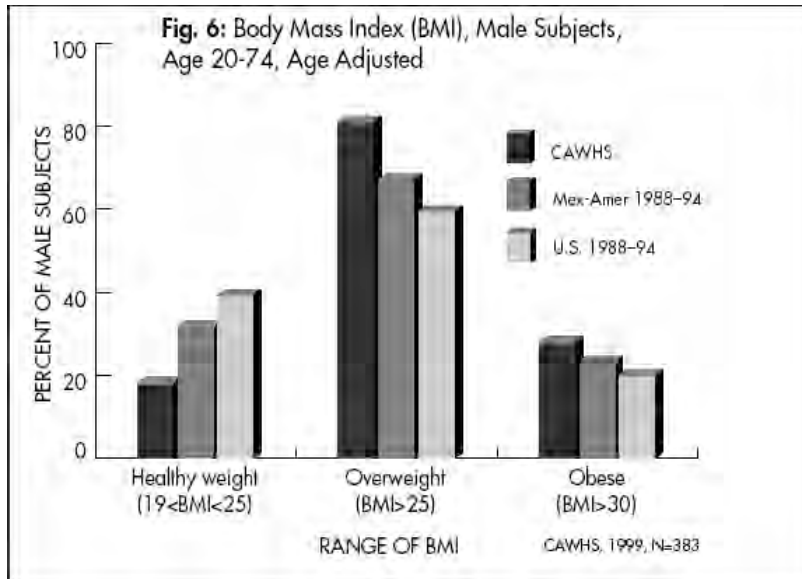
High Blood Pressure, Males



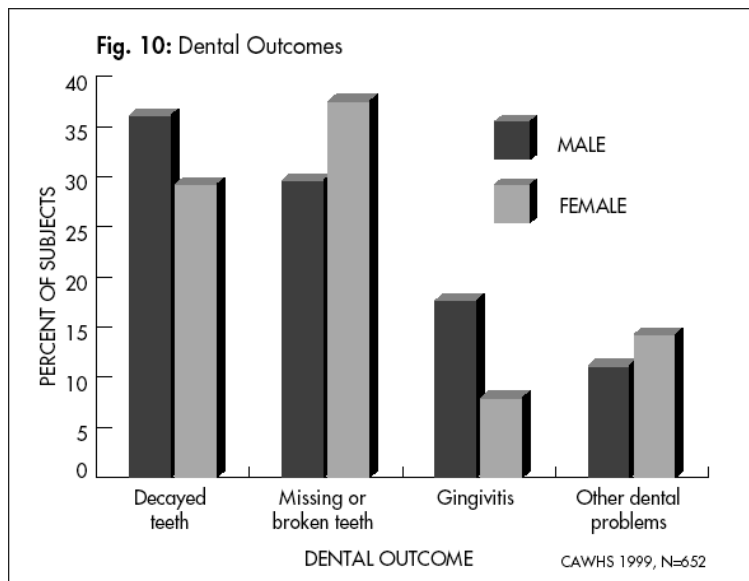
Anemia, Males



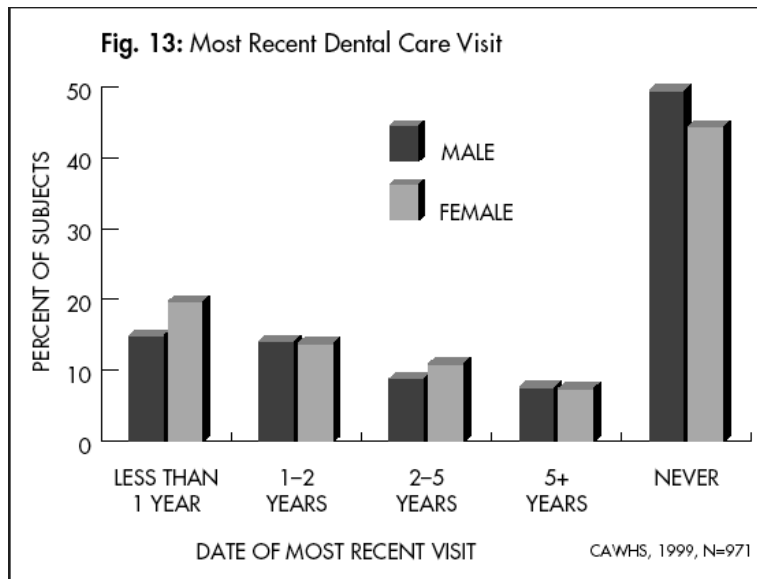
Body Mass Index, Males



Dental Outcomes, Male & Female



Most Recent Dental Care Visit, Male & Female



The Effect of Acculturation on Reproductive Risk Factors and Birth Outcomes among Hispanic Women: The SHARE Study

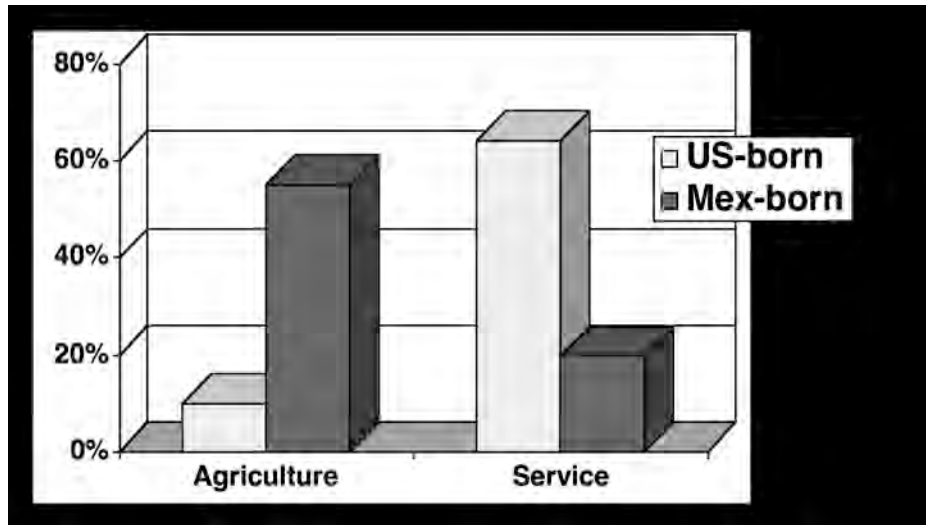
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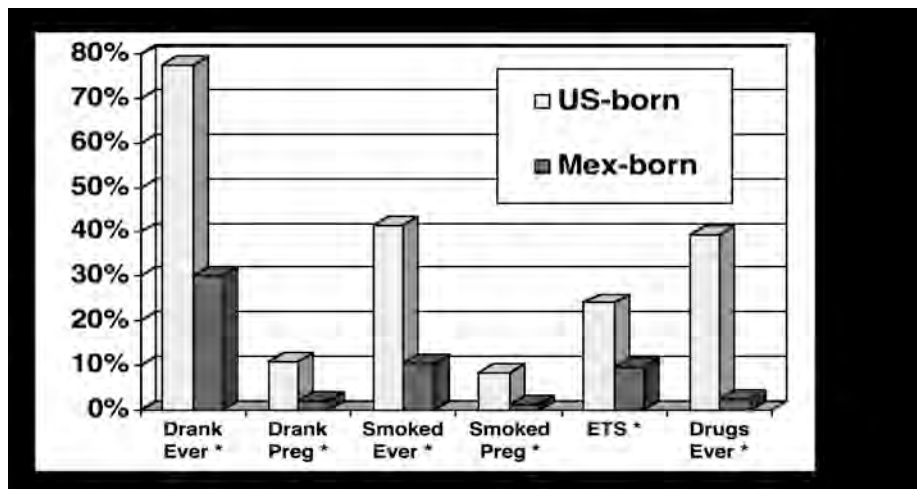
²Maternal and Child Health, School of Public Health,
UC Berkeley

(Supported by NIEHS, # ES09867)

Occupation in Past Year by Place of Birth



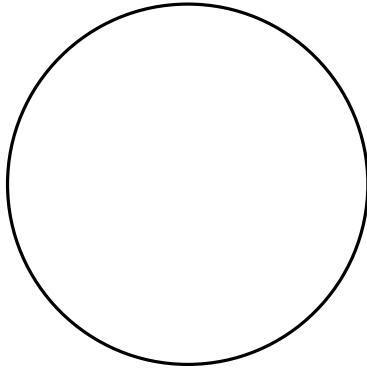
Behavioral Risk Factors for U.S. vs. Mexico-Born



P < 0.05 for all comparisons

Factors Affecting Farmworker Health

Poverty



Occupational/
Environmental
Exposures

Behavior/
Acculturation