



- ▶ AgriSafe Network
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# OPTIMIZING THE HEALTH OF WOMEN IN AGRICULTURE



# *Protecting the People Who Feed the World*

**AgriSafe protects the people who feed the world by:**

- Performing ongoing needs assessments of agricultural producers and workers (following the Total Farmer Health® model).
- Training rural health professionals across the United States.
- Establishing partnerships with NIOSH ag. centers, rural research centers, and other non-government-based organizations.
- Maintaining a culture of readiness and organizational expectation to protect and respond.



# GOALS

## Identify

Identify a minimum of four factors related to **women's health and safety** in agriculture.

## Discuss

Discuss solutions including health approaches that address the safety and health challenges faced by women in agriculture.

## Review

Review a minimum of three recommended clinical and community health resources that can be used to prevent farm & ranch related illness and injuries among women.



# Women in Agriculture

- They're Secondary Operators
- They're Mothers
- They're Agricultural board/advisory council members
- They're Sustainable Ag literacy advocates
- They're Farm Managers
- They're Animal husbandry experts
- They're Entrepreneurs
- They're Bookkeepers
- They're Family Mediators
- They're Businesswomen
- And They're Farmers

FROM THE HOME FRONT TO THE  
FOREFRONT



United States  
Department of  
Agriculture

# #WomenInAg



**1,224,726**

**Women  
Farmers in the  
United States**

National Agricultural Statistics Service, 2024a

**407,340,844**

**Acres**

National Agricultural Statistics Service, 2024a

**\$12.9 billion**

**Economic Impact**

University of Georgia, n.d.

**38.7%**

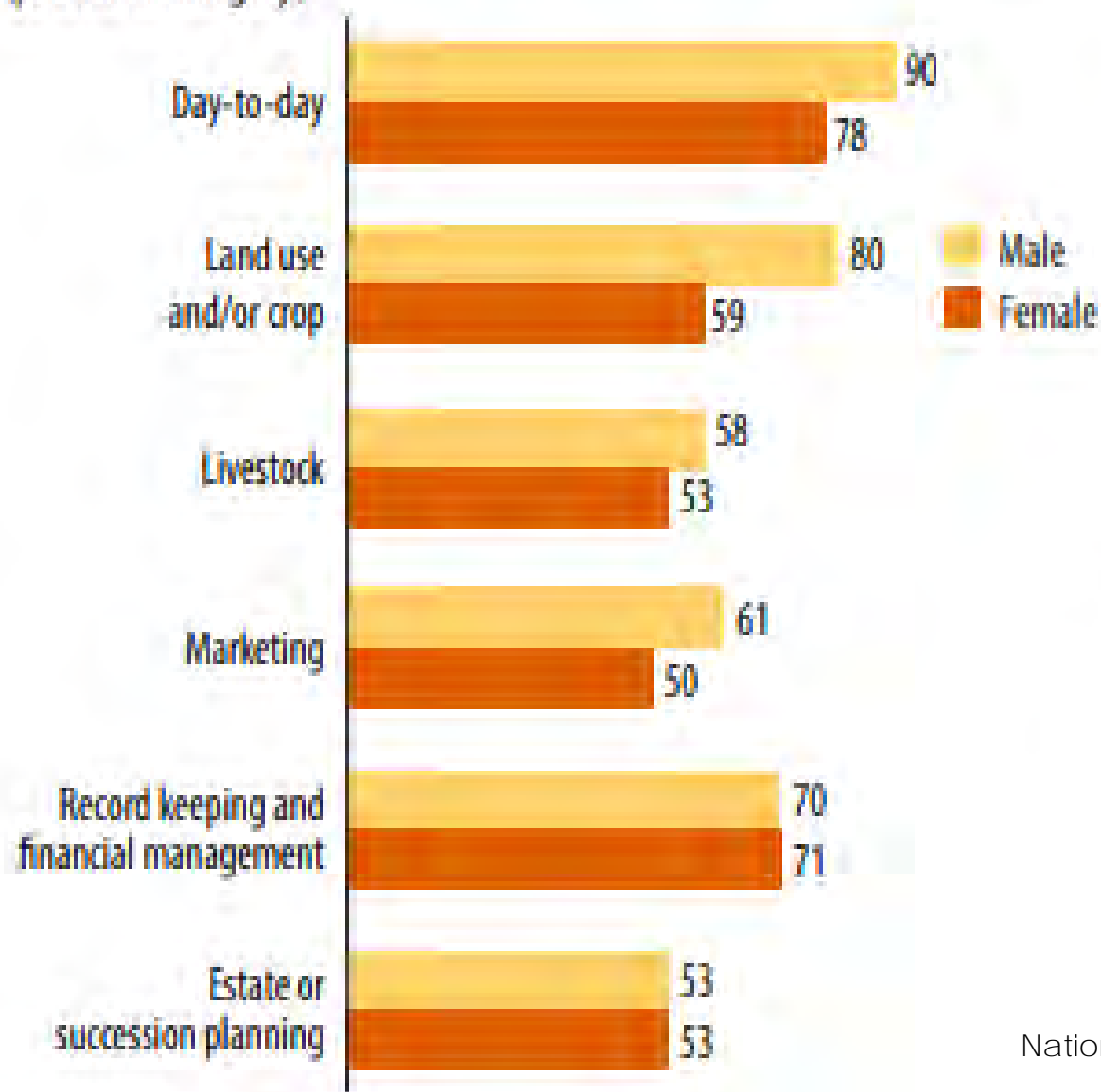
**of American  
Farmers are Women**

National Agricultural Statistics Service, 2024a



## Farm Decision Making by Type of Decision and Sex of Producer, 2022

(percent of category)



*Male producers had higher rates of involvement in land use and/or crop, livestock, and marketing decisions than female producers.*

*Female producers were most involved in day-to-day, record keeping and financial management decisions.*

- ▶ Themes of Masculinity and Farming
- ▶ Increasing Number of Women taking active and equal roles
- ▶ *This study illustrates obstacles to female self perception as well as the ability for women to adapt, even as the institution of farming does not.*

*Smyth et al., 2018*

# SELF PERCEPTION WOMEN FARMERS



Photo credit: W Production



# MIGRANT WORKERS

ESTIMATES BETWEEN 2.4 MILLION HIRED FARMWORKERS IN THE US, INCLUDING MIGRANT, SEASONAL, YEAR-ROUND, AND GUEST PROGRAM WORKERS.  
(MIGRANT CLINICIANS NETWORK, N.D.)



➤ 72% Men; 28% women;  
Avg. age 39.7 years

HRSA defines as at least 51% of income is derived from agricultural employment at any time within the past 24 months or prior to retirement or disability.

Migrant- (moves for employment and provides temporary home for purposes of employment).

Seasonal – Does not move for employment, works seasonally not year-round.



Photo Credit- Agri-Pulse Feb 14, 2018 Simon Schuster



# TOTAL FARMER HEALTH<sup>®</sup>



# PREVALENCE

The range of farm activities compound the problem of assuring a safe worksite for farm women who have their own inherent contraindications.

The National Institute for Occupational Safety & Health (NIOSH) lists numerous women's safety and health issues related to an agricultural job including:

- acute and chronic pesticide exposures,
- chronic bronchitis among nonsmoking farm women,
- pregnancy related risks,
- farm work-related injuries,
- exposures to inhaled substances in the workplace and
- risk factors for female infertility in an agricultural region.

Prater, 2022





# HEALTH AND SAFETY EDUCATION

Safety education for the agricultural population is often aimed at the men in farming operations, resulting in women in agriculture being less prepared to prevent acute injuries, illness, and long-term chronic conditions related to agricultural work.

Occupational health research on farm workers struggles to incorporate gender analysis into research design and analytical approaches. The role of gender in shaping health outcomes is evident in occupational health research.

Habib et al., 2014





- Each farm family has its own set of values that are influenced by the family's ethnicity, socioeconomic status, level of education, and cultural traditions
- These values influence the division of labor on farms, and women's potential exposure to multiple roles, factors contributing to occupational illness, stress, fatigue, and agricultural injuries.

# CULTURAL CONSIDERATIONS

Weinert & Burman, 1994

# HEALTH DISPARITIES – RURAL WOMEN

- Poorer Health Outcomes
- Less Access to Care than Urban Women
- Limited numbers of Health Care Providers (Women's Health)

American College of Obstetricians and Gynecologists, 2014

- Comparisons
  - ↑ Ischemic Heart Disease (fatalities)
    - CAD mortality among rural women increased since 2009
  - ↓ Preventive Screening Services (Breast & Cervical Cancer)

Bossard et al., 2020

# HEART DISEASE

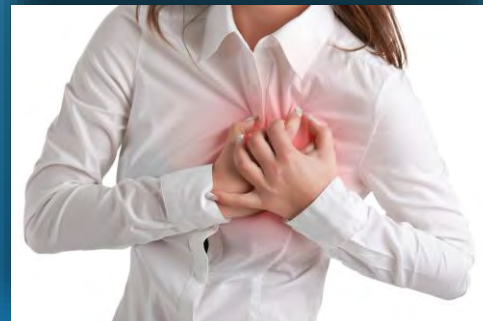


# CARDIOVASCULAR DISEASE (CVD)

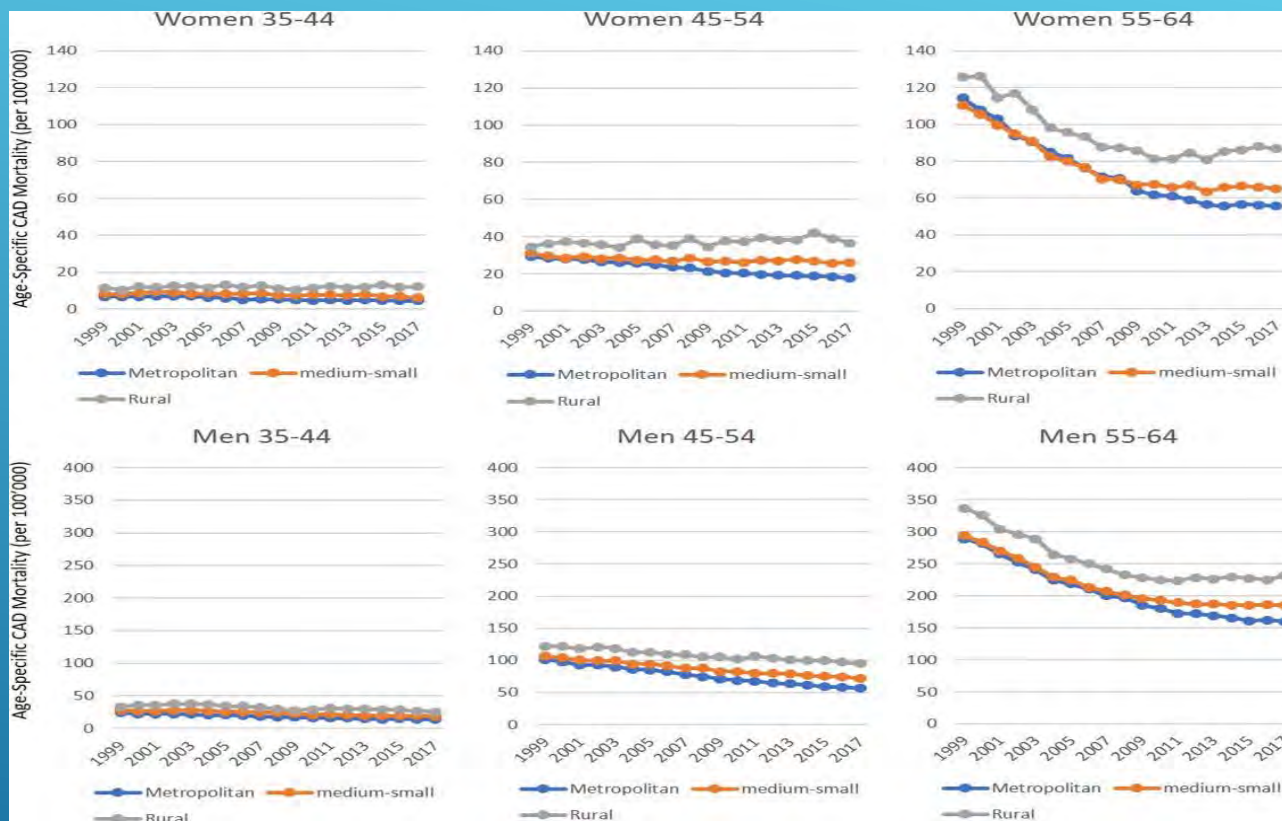
## MYOCARDIAL INFARCTION (HEART ATTACK)

### *BY THE NUMBERS*

- More women than Men have CVD
- CVD mortality is greater for women than men
- Average age for a woman to experience 1st MI-71.8yrs, Average age for a Male to experience 1st MI-65yrs
- CVD leading cause of death for Hispanic and Black women
- 26% of women die within 1 year of having an MI, compared to 19% of men



## ■ Age specific Mortality rates stratified by sex, and urbanization 1999-2017



Although males are more likely to develop heart disease, females in rural areas still have higher death rates than metro in recent years, and since 2009 there is an increase in the number of CAD deaths

Metro: Residents number more than 50,000  
Non-metro: often refers to rural area

Bossard et al., 2020

# HEART DISEASE IN WOMEN

## **Medical conditions and lifestyle choices that can put women at higher risk of heart disease:**

- High blood pressure
- High LDL (low-density lipoprotein) cholesterol
- Smoking
- Diabetes
- Excess weight
- An unhealthy diet
- Physical inactivity
- Drinking too much alcohol
- Stress and depression

## **Women also face specific factors related to reproductive health and pregnancy, including:**

- Early first period (before age 11)
- Early menopause (before age 40)
- Polycystic ovary syndrome
- Diabetes during pregnancy (gestational diabetes)
- Preterm delivery
- Delivery of a low birth weight or high birth weight infant
- Hypertensive disorders of pregnancy





APRIL 2022

## HAY THERE

a monthly-ish nutrition newsletter for  
rural families

enjoy our curated list of resources, recipes & helpful tips!

### HAVE YOU HERD?



Click here to learn about fueling your body with grains.

### FOOD FOR THOUGHT

A 20OZ BOTTLE OF POP CONTAINS  
OVER 16 TSP OF SUGAR!

# WANT TO LEARN MORE?

*Subscribe to "Hay There", a  
monthly-ish newsletter full of:*

- *Nutritious Recipes*
- *Helpful Resources*
- *Information to make the  
healthy choice the easy choice!*



DIET



# N

## EXTENSION

# COPD

# Nearly 5 million people living in rural counties have been diagnosed with COPD.

Hundreds of thousands more don't know they have it.

[nhlbi.nih.gov/breathebetter](http://nhlbi.nih.gov/breathebetter)



National Heart, Lung,  
and Blood Institute

**LEARN MORE**  
**BREATHE BETTER™**


- Almost twice as many rural Americans have COPD
- Almost twice as many rural Americans die from COPD
- In 2015, rural Medicare patients experience 27% more hospitalizations and 71% more deaths from COPD than urban patients

Croft et al., 2018





# RESPIRATORY EXPOSURES

- 
- Farm women have been overlooked in the evaluation of respiratory hazards of agriculture, although they commonly perform tasks that are similar to those done by men.

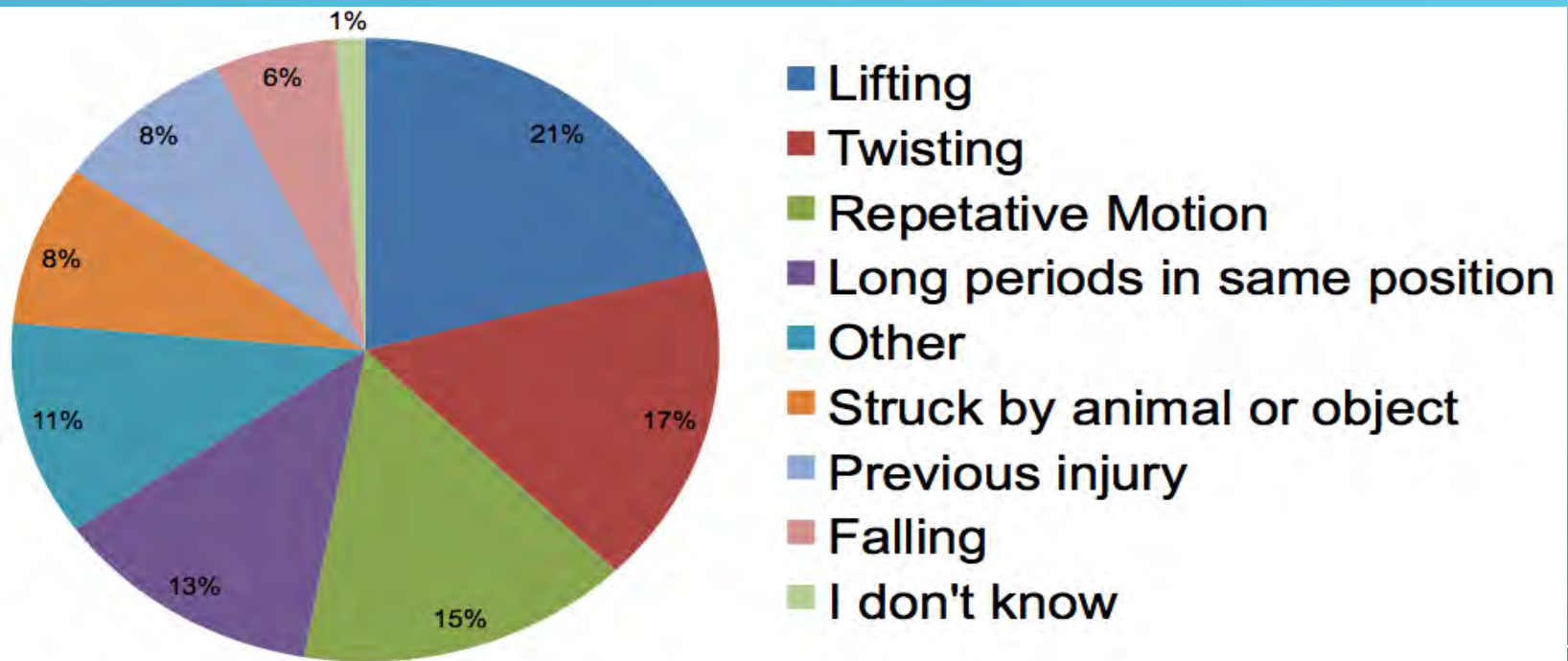
Pesticides as well as grain and dust exposures were associated with chronic bronchitis among non-smoking farm women.

*Valcin et al., 2007*



# MUSCULOSKELETAL INJURIES

# PERCEIVED CAUSE OF BACK PAIN



Note: respondents could choose multiple options



# Whole Body Vibration

WBV occurs when the shaking motion of a vehicle is transferred to the operator through the feet, seat, or backrest.



## Health Effects



Speech interference



Increased heart rate and blood pressure



Muscle fatigue and cramping



Increased breathing rate



Disruption of balance and perception



Low back pain and damage to the spine

## Average Operation Time before Reaching Recommended Daily WBV Exposure Limits



\* Each vehicle used during the day contributes to overall WBV exposure

\*\*Recommendations based on exposure limits from the European Union

## Prevention Strategies



### Maintain Equipment

Keep tires properly inflated

Maintain vehicle suspension system according to the manufacturer's specifications



### Adjust the Seat

Adjust the seat suspension properly so the seat doesn't bottom out during use

Adjust the position of the seat to improve posture

Use a backrest with lumbar support



### Be Aware of Terrain

Slow down when traveling across rough terrain

Maintain soft-surface roads/tracks

Alter your routes to avoid rough terrain if possible



### Take Care of Your Back

Avoid long hours of continuous operation

Avoid twisting your back while operating vehicle

Minimize forward leaning posture when driving



### Stop and Take Breaks

Take breaks periodically

Avoid lifting materials immediately after long periods of driving



[www.facebook.com/GPCH](https://www.facebook.com/GPCH)



[www.twitter.com/GPCH](https://www.twitter.com/GPCH)



**GREAT PLAINS**  
Center for Agricultural Health  
[www.gpcah.org](http://www.gpcah.org)

- Women have anatomical and physiological differences that may place them at risk for farm injuries

Females are, on average, shorter than men and have more adipose tissue. Females also have narrower shoulders, wider hips and proportionally have shorter legs and arms than their male counterparts

On average upper body strength is 40% - 50% less in females than in males, while lower body strength is 30% - 40% less in females (Nuzzo 2023).

Older female farmers report factors of sleep and mental well-being significantly impact musculoskeletal pain. Considerations of both physical and psychological factors in ergonomic assessments is key to improving health outcomes (Shin, Jeong 2022)





# Machinery Build and Women



The placement of levers and the strength required to move them, may be more suited to the average male. (Carruth et al., 2001).

## Correlation of Tractor Use and Injury



Driving tractors an average of one day a week has been found to increase the risk of nonfatal farm injury(Carruth et al., 2001).



# AGRISAFE PILATES

## BEGINNING BASIC INSTRUCTIONS

These exercises are designed to improve balance, core strength and flexibility. At all times, the core is engaged with the rib cage drawn together and the navel pulled towards the spine. Remember to breathe with each exercise focusing on exhaling on the motion and drawing the navel even deeper into the spine. All exercises can be repeated 8-12 times.



Protecting the People Who Feed the World

www.agrisafe.org

## Standing Resistance Band Row

**Shoulder's Core**  
Anchor resistance band to a stable post about waist height. Flexed knees can be substituted. Soften the knees, brace the core and extend arms forward and eliminate any hump in the back. Keeping the shoulders relaxed, pull elbows back squeezing the shoulder blades together. Spine remains in the neutral position.



**Yogi's Bridge**  
Lie on the back with hands by the side. Bend knees and pull feet no more than hip distance apart. Lift the hips and squeeze through the glutes. Avoid arching the back or allowing the knees to turn in or out.

BRIDGE

## TABLETOP EXTENSION

**Upper Back**  
Begin on the hands and knees and engage abdominal to find a neutral spine position. Without moving the center of the body, extend the right arm and left leg squeezing through the glutes and hips. Repeat on the other side.



**Shoulder's Flexion**  
**Upper Back**  
Find a stable surface such as wall or round hay bale and place hands shoulder width apart. Move feet away 4-6 ft and lower chest towards the surface and then push up. Body should remain in a straight line. Add a challenge by lifting one foot at a time.

STANDING PUSHUPS

## SIDE BEND WITH RESISTANCE BAND

**Shoulder's Flexion**  
Stand with knees soft, feet hip distance apart. Place resistance band directly over shoulders. Maintain the distance between the hands and bend towards the right. Gently pull down with the right arm then return to shoulder width and stand back up. Repeat on the left side. Avoid any twisting in the hips or spine.



**Upper Glutes/Hips**  
Begin standing with knees slightly wider than hip width. Holding onto the tractor, lower hips and keep chest flat. Return to starting position squeezing the tops of the legs.

TRACTOR SQUAT

## MOUNTAIN CLIMBERS

**Shoulder's Flexion**  
Begin in plank position with hands directly under the shoulders. Feet no wider than the hips. Draw the right knee into the chest and then the left. Spine should remain in neutral position with the neck extending straight out of the spine. The goal is that the hips do not in or out throughout the exercise.



**Weightless Single Leg Deadlift**  
**Shoulder's Core**  
Step the left foot forward and extend arms shoulder height. Keeping a flat back, lower the hands towards the ground without hinging the hips. Once the upper body is parallel to the ground, return to standing position. Repeat on the other side.

WEIGHTLESS SINGLE LEG DEADLIFT

# AGRISAFE YOGA

## BEGINNING BASIC INSTRUCTIONS

When trying these poses, nothing should ever hurt. If there is new or sharp pain, move away from the pose. When you feel ready, slowly ease back into the pose and stop when it feels safe and "good". Breathe deeply in every pose, pay attention to the full inhale and complete exhale. Always keep a small hand in your knees, never lock them back when legs are straight. Every body will find different in each pose. Listen to YOUR body.



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TWIST



EAGLE ARMS



CHILD POSE WITH BENT ELBOWS



COW FACE ARMS



STANDING DOG



SIDE BEND



STANDING LUNGE



SHOULDER STRETCH WITH SHOVEL

**Shoulder's Upper Back**  
Cross arms at elbows, bring backs of hands together. If shoulders are flexible enough, you may be able to wrap arms around so palms of hands can come together. Experiment with lifting elbows and moving hands away from face to deeper stretch between shoulder blades.

**Shoulder's**  
Lift one arm straight up, then bend elbow so hand comes behind the head, grab the elbow with other hand and gently increase stretch to comfort level.

**Side of Body**  
Legs can be flat on ground or one leg can cross over the top of other. Lift outside arm and stretch toward toes or wall. Come in and out of stretch a few times.

**Shoulder's Triceps**  
**Upper Back**  
Arms can be as wide as is comfortable. Lift toes above head, then slightly back. Elbows can bend, grip and breathe where it feels good. Can eventually deepen stretch or twist, as shoulders feel ready. Pull front ribs back toward spine to support low back.





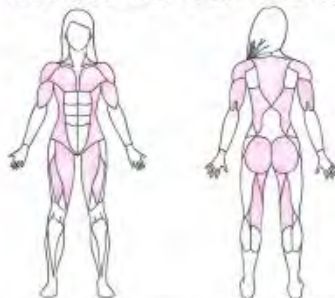
# Ready to Farm

## farm task



**calf carrying**

## muscles used

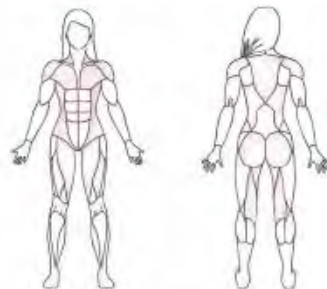


triceps, shoulders, upper back (trapezius), chest (pectoralis), lower back, back of legs (hamstrings)

## poses to improve muscle strength and flexibility



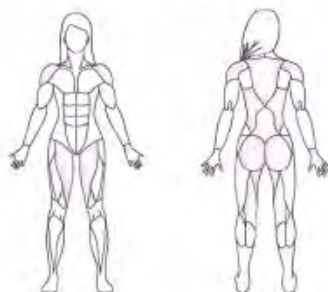
**grain scooping**



shoulders, lower back, upper back, chest (pectoralis), hips, hip flexors



**throwing hay**

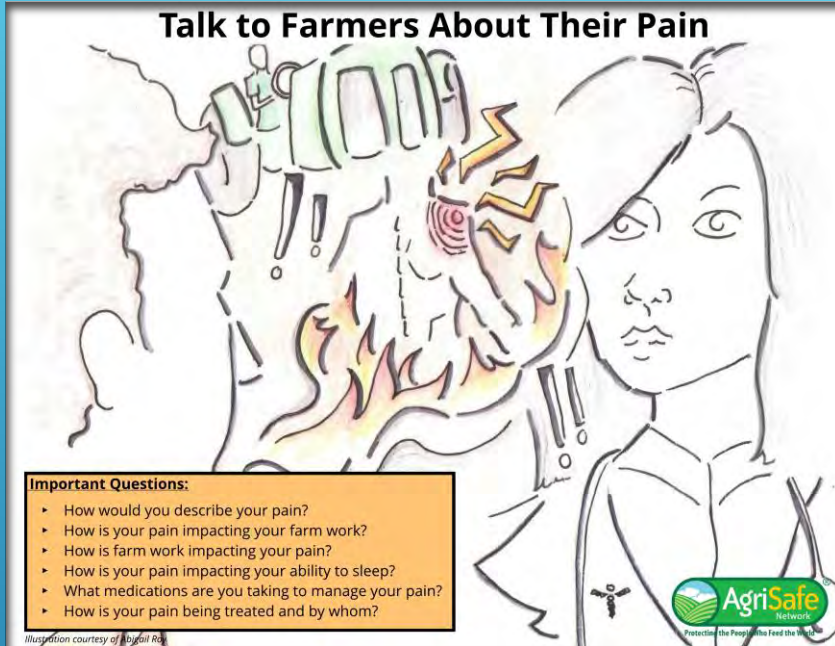


upper and lower back, shoulders, hamstrings, hips, hip flexors



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## Talk to Farmers About Their Pain



- ▶ 2015, rates of rural vs. urban drug overdose deaths:  
17.7 per 100,000 vs. 16.7 per 100,000
- ▶ CDC, MMWR 2017

# PAIN PRESCRIPTION MISUSE

# OSTEOPOROSIS





## DID YOU KNOW?

**1/2** 1 in 2 postmenopausal women will have osteoporosis and most will suffer a fracture during their lifetime.

**15B** The overall cost to the US for the care of osteoporosis is close to **15 billion** dollars. Mostly relating to nearly **400,000** hip fractures in the US.

**20%** 1 in 2 who experience hip fractures will not return to their previous lifestyle and **20%** will die as a consequence of their fracture.

 Spine fractures are associated with significant back pain, poor quality of life, and greater mortality.

Sex (Female)

Postmenopausal

Alcohol  
consumption

Caffeine intake

Smoking  
cigarettes

History of  
fractures

Older age

Inadequate  
Calcium intake

Inadequate  
Vitamin D

Low body  
weight

# RISK FACTORS FOR OSTEOPOROSIS:

# FALLS IN THE AG WORKPLACE

*Same-level or low-level falls* (also referred to as slips & trips) refer to falls under 10 feet. They represent a higher level of frequency (60%) but typically\* lower level of severity

- Steps / curbs
- Fence climbing
- Uneven surfaces
- Slippery surfaces (water, oil spill, ice)
- Objects in walk path (shovels, rakes, rope, cords, boxes)
- Trip over small or shorter animals (pets, young pigs, etc.)
- Struck by animals
- Falls from horses – *extremely dangerous as they are usually in motion!*

*Even low-level falls can result in severe head and spinal injury, serious fractures, or the loss of vision (i.e.: upturned rakes)*



# REPRODUCTIVE HEALTH

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# Risk of Adverse Pregnancy Outcomes

## **Work-Related Exposures:**

- Herbicides: Dicamba, Glyphosate, Acetic Acids, Thiocarbamates
- Insecticides
- Carbon Monoxide
- Nitrate Toxicity (formula-fed infants)
- Livestock Production Hormones (needlesticks)
- Oxytocin
- Prostaglandin
- Zoonotic Infection
- Brucellosis, Q Fever, Listeria (cause abortion)



# ZOONOTIC DISEASE

- ▶ Q fever
- ▶ Chlamydiosis
- ▶ Toxoplasmosis
- ▶ Listeriosis
- ▶ Leptospirosis
- ▶ Brucellosis

## Reproductive Health Exposures for Women in Agriculture

**Herbicides** are used to kill undesirable plants or weeds.

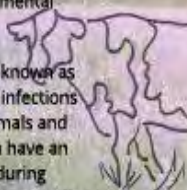
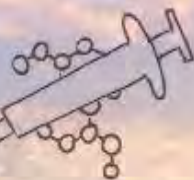
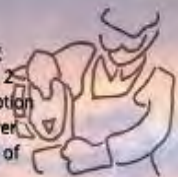
**Exposures:** Mixing and applying herbicides and fungicides up to 2 years before attempting conception is associated with observed lower fertility. **Risk:** Could lower rates of fertility.

**Needlestick Injuries** are wounds caused by needles that accidentally puncture the skin. **Exposures:** Livestock production hormones; Oxytocin & Prostaglandin. **Risk:** May cause abortion during pregnancy in pregnant women.

**Carbon Monoxide** is a colorless, odorless, tasteless gas produced by burning gasoline, wood, propane, charcoal or other fuel. **Exposures:** Livestock buildings and high pressure washers. **Risk:** High for women and elevated risk in unborn fetus including low birth weight, slowed mental development.

**Zoonotic Diseases** (also known as zoonoses) are caused by infections that spread between animals and people. Pregnant women have an altered immune system during pregnancy. **Exposures:** Direct/indirect contact, vector-borne, foodborne. **Risk:** May cause abortion in pregnant women.

**Nitrate Toxicity-** Infants who are fed formula made with water high in nitrate concentrations ( $>10$  mg/L) have the potential to be poisoned. **Risk:** A congenital health disease known as Blue Baby Syndrome.



## Personal Protective Equipment (PPE) Pesticides

Women who are pregnant or planning a pregnancy, especially those currently performing farm work, should be informed of the implications of exposure before, during and after pregnancy, and assisted in making decisions that are appropriate for their individual work and home situations.

Source: EPA - Recognition and Management of Pesticide Poisonings

Coveralls over short-sleeved shirt and short pants including chemical-resistant gloves. Be cautious in warm conditions and the risk of overheating, swelling and fluid retention in the hands, legs and feet.



Use a properly fitting, NIOSH approved two strap respirator. Limit your time in exposures requiring respiratory protection.



Footwear must be chosen based on the hazards that are present. Avoid natural leather footwear, as it absorbs chemicals. For working with pesticides, chemical-resistant footwear plus socks are recommended.



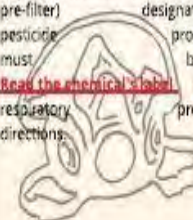
Protective eyewear intended to shield the eyes against liquid or chemical splash, irritating mists, vapors, and fumes. Use goggles with a good seal, avoid exposure if possible.



Footwear that will provide good grip and adequate protection against other hazards.



Working with chemicals: Respirator with cartridges (and dust pre-filter) designated for pesticide must be used. Read the chemical's label for respiratory protection directions.



For additional information and resources visit [www.agrisafe.org/women](http://www.agrisafe.org/women)

AgriSafe Webinar on Reproductive Health Risks





# ZOONOTIC DISEASE RESOURCE

## ZOONOTIC DISEASE IN AGRICULTURE



Zoonotic Diseases are transmitted between farm animals and humans.

According to the World Health Organization, more than half of all human **pathogens** are **zoonotic** and have represented nearly all of all **emerging** pathogens during the past decade. Farmers and farm workers have higher levels of risk for contracting zoonotic diseases because of the frequency of their exposure to animals.

Prevention is the best defense. Understanding how the disease transmission process works, building a team and effectively communicating within that team are essential in preventing the spread of zoonotic disease.

### PROTECT YOURSELF:

- ✓ Choose and use appropriate personal protective equipment (PPE)
  - respiratory protection
  - gloves
  - safety glasses/goggles
  - clothing: coveralls, aprons, etc.
  - foot gear
- ✓ Designate specific clothes for farm and ranch work
  - use laundry precautions – launder separate from other family clothing
  - clean washing machine between washes
- ✓ Disinfect work spaces with appropriate and clearly labeled designated cleaning solutions
- ✓ Provide designated hand washing area for workers
  - hot water is recommended
  - hand washing station should be designed hands free if possible
  - use paper towels to dry
- ✓ While walking or working wear
  - sturdy shoes
  - long pants
  - insect repellent
- ✓ Inspect entire body, neck, face, and hair for cuts, scrapes or bites daily
- ✓ Thoroughly clean, treat, and cover any open area prior to contact with animals
- ✓ Check medical records for tetanus vaccine status

### TERMS TO KNOW:

**PPE:** personal protective equipment  
**Pathogen:** an agent that causes disease, especially a virus, bacterium or fungus.

**Infectious disease:** a disease caused by bacteria, viruses, fungi, or parasites that can be transferred to humans

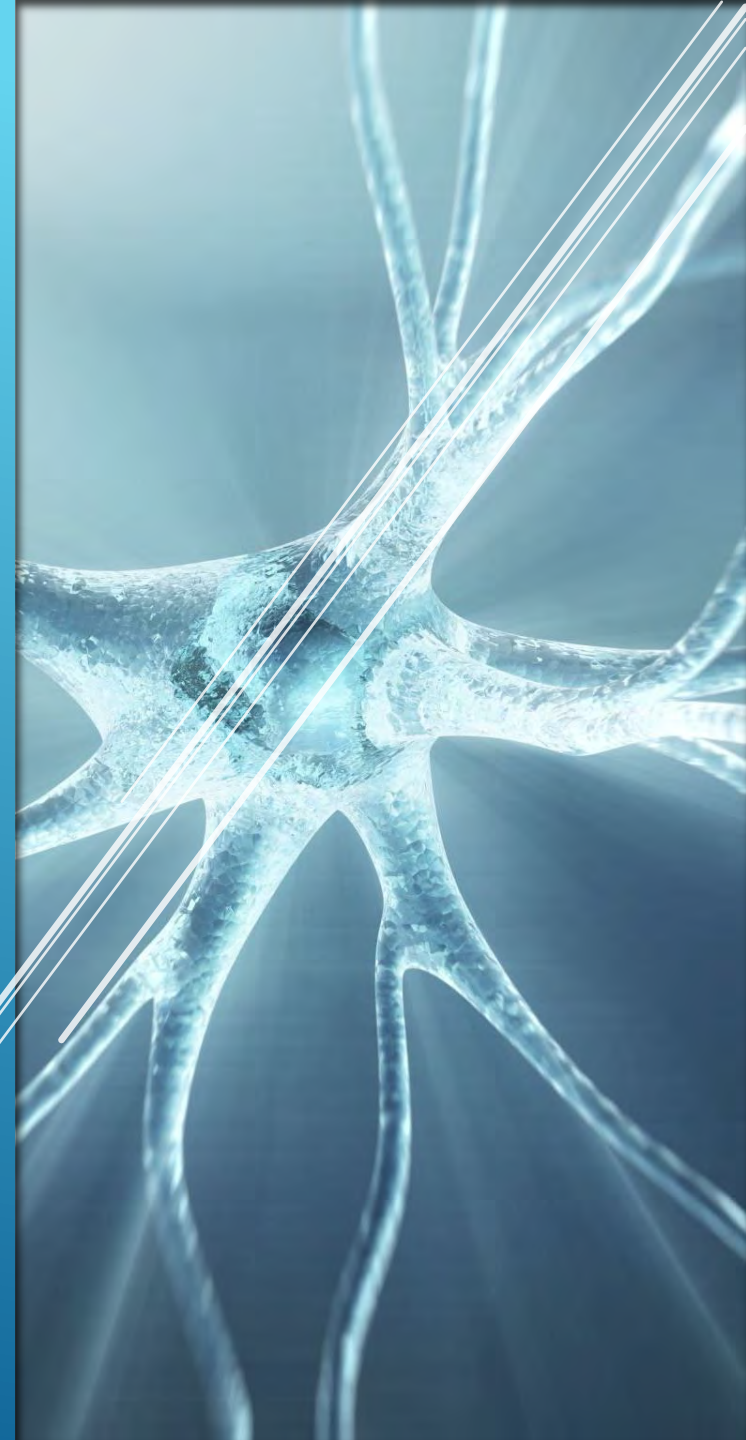
**Zoonotic disease:** an infectious disease which can be passed between animals and humans

**Emerging infectious disease:** an infectious disease whose incidence in humans has increased in the past two decades or threatens to increase in the near future

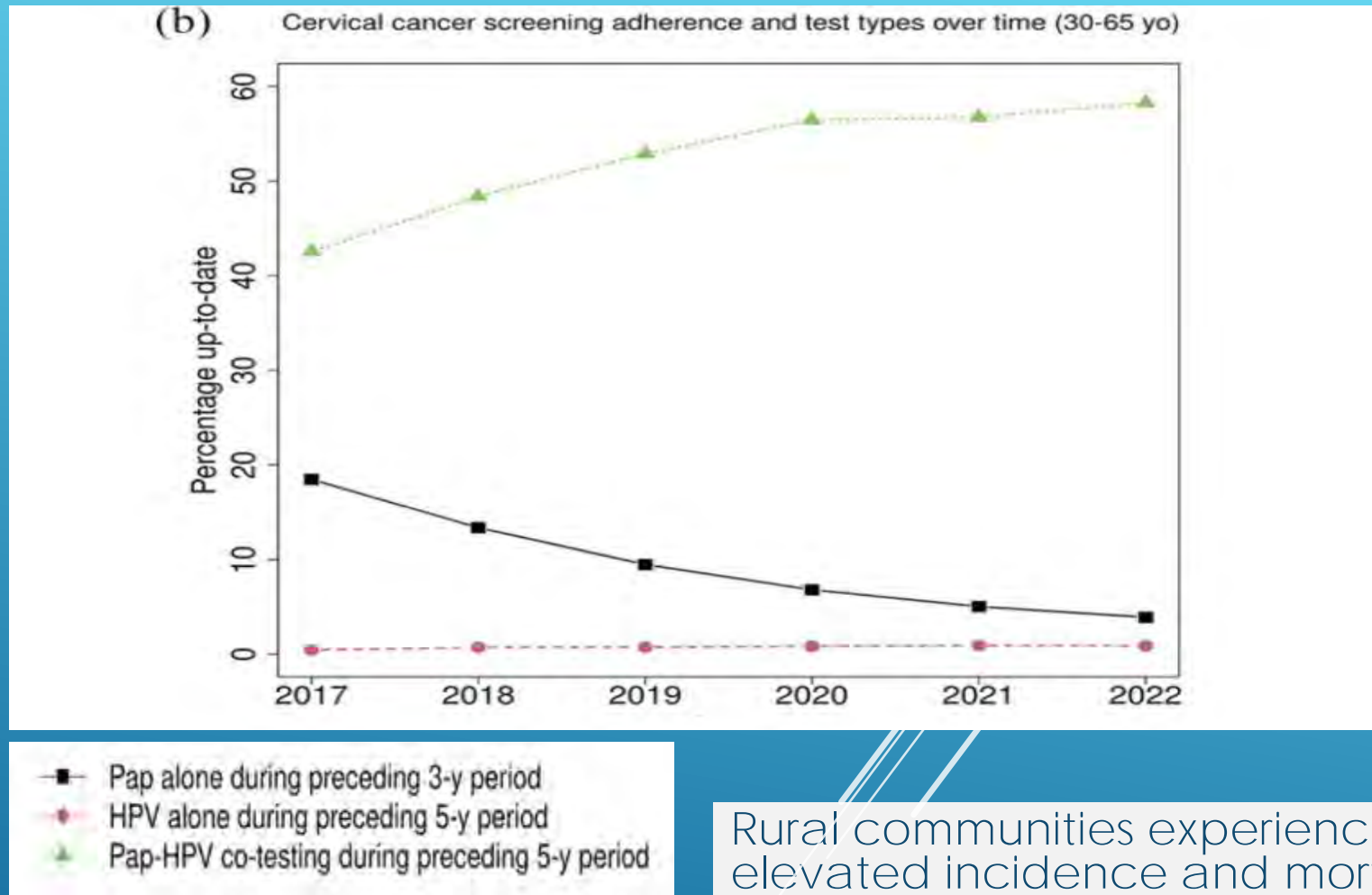




# RURALITY & CANCER RATES



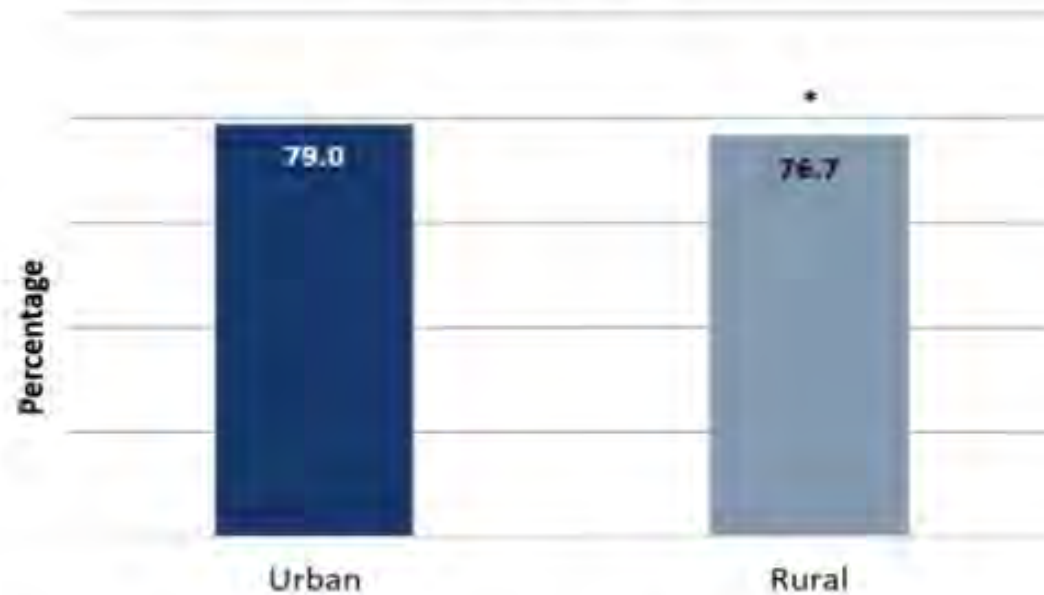
# Cervical cancer screening Midwest and Rural



Rural communities experience elevated incidence and mortality of human papillomavirus (HPV)-associated cancers and correspondingly low HPV vaccination rates.

## Breast Cancer Screening

Percentage of MA enrollees (women) aged 50 to 74 years who had appropriate screening for breast cancer, by geography, 2019



SOURCE: Clinical quality data collected in 2019 from MA plans nationwide.

NOTES: Clinical quality data not available for FFS Medicare beneficiaries.

Breast Cancer Screening - Data  
Snapshot October 2022 (cms.gov)

# PESTICIDE EXPOSURES



# CLINICAL APPROACH

## EPA - Recognition and Management of Pesticide Poisonings

Women who are pregnant or planning a pregnancy, especially those currently performing farm work, should be informed of the implications of exposure before, during and after pregnancy, and assisted in making decisions that are appropriate for their individual work and home situations .

### Further recognition:

Providers should encourage mothers to avoid exposure that might contaminate breast milk without unduly alarming them, perhaps by associating it with the importance of not smoking or drinking alcohol during pregnancy and nursing .

Breast feeding should continue to be strongly encouraged since all evidence indicates that the known benefits far outweigh the potential risks.

Reproductive Health Effects of Pesticide Exposure

Issues for Farmworker Health Service Providers

Migrant Clinicians Network

Pamela Rao PhD

Farmworker Justice





# CLINICAL APPROACH TO REDUCE PESTICIDE EXPOSURE

- Rural health/primary care providers are in an ideal position to identify and assess a patient's risk for exposure.
- The first step is to obtain an environmental history that covers
  - residential and employment histories,
  - types of work activities performed currently and in the relevant past, and
  - possible sources of exposure to biological or chemical agents. For each exposure source identified, additional information needs to be collected, such as frequency, duration, and intensity.

Source: Reproductive Health Effects of Pesticide Exposure;  
Issues for Farmworker Health Service Providers  
Pamela Rao PhD, Farmworker Justice  
Migrant Clinicians Network



# CLINICAL RESOURCES

- EPA Recognition and Management of Pesticide Poisonings
- Online or Free manual

**EPA** United States Environmental Protection Agency

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## Recognition and Management of Pesticide Poisonings

### Overview

The *Recognition and Management of Pesticide Poisonings: 6<sup>th</sup> Edition* gives healthcare providers a quick reference resource for the best toxicology and treatment information for patients with pesticide exposures.

This manual also guides clinicians on how to:

- Conduct environmental and occupational exposure screening on patients
- Report of exposure incidents
- Find a wealth of available pesticide information resources

This manual was developed under a cooperative agreement between the EPA and the Medical University of South Carolina, and as such, reflects the views of the authors and not the EPA.

The EPA has developed **Questions and Answers** to provide additional clarification on chronic effects.

To order a **FREE** hardcopy of the manual, contact EPA's National Agricultural Center at:  
<http://www.epa.gov/agriculture/awor.html>

- Look for the EPA publication number: 735K13001.



United States Environmental Protection Agency  
Office of Pesticide Programs  
EPA 735K13001

**EPA** Recognition and Management of Pesticide Poisonings

Sixth Edition

# PESTICIDE SAFETY MANTRA

## ➤ Read the Label

Right mask

Right Fit

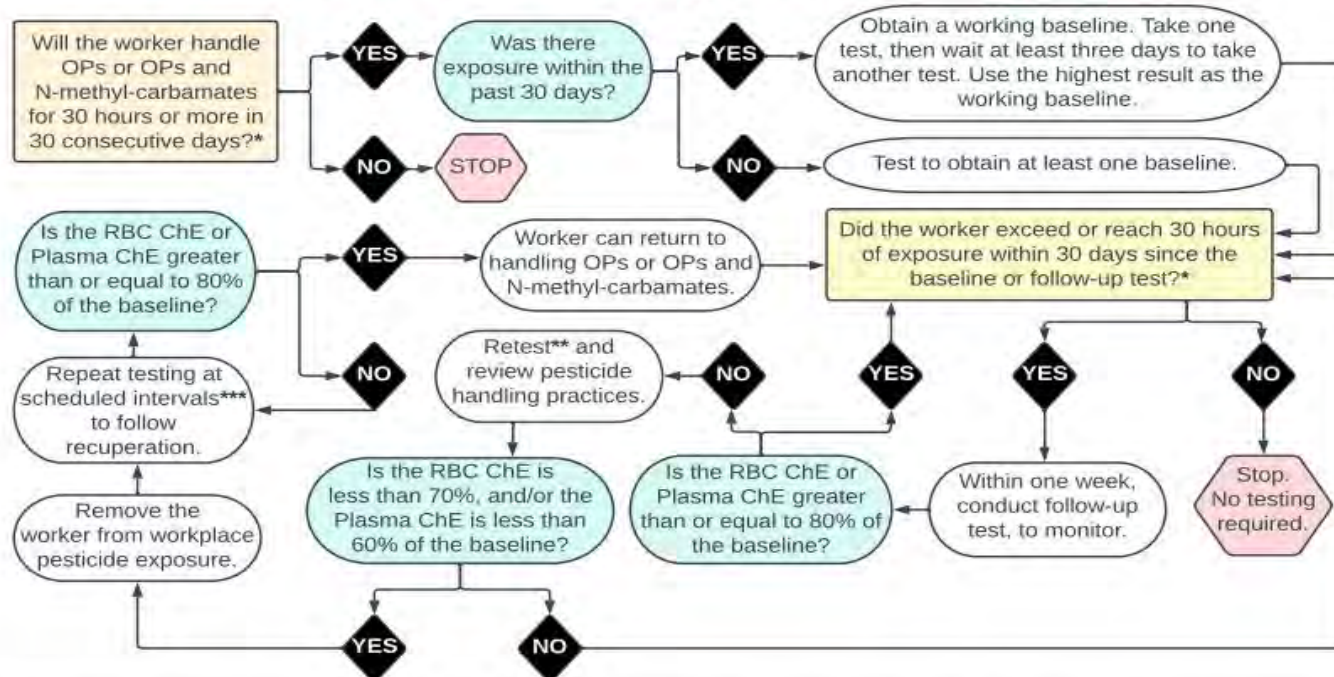
Right Environment





# Cholinesterase Algorithm

## Cholinesterase Testing Protocol Algorithm



\*This is the Washington (WA) state recommendation. California (CA) state recommends follow-up testing if worker reaches 6 days of exposure within a sliding 30-day schedule. At this time, WA and CA are the only states with formal cholinesterase monitoring programs with regard to pesticide exposure. Days of exposure are easier to track than hours of exposure.

\*\*Retesting is strongly recommended but not mandatory.

**Threshold exposure level:** When the worker exceeds or reaches 30 hours of exposure in a 30-day period.

**OPs:** Class I or Class II organophosphates.

**RBC ChE:** Acetylcholinesterase, also known as red blood cell cholinesterase.

**Plasma ChE:** Butyryl cholinesterase, also known as plasma cholinesterase.

### NOTES:

• Obtain baseline prior to pesticide work or after 30 days of worker being exposure free.

• When testing, it is recommended to get both RBC ChE and Plasma ChE. But if only performing one test, then do Plasma ChE.

• A second baseline is recommended for improved precision but not essential.

• N-methyl carbamates do inhibit cholinesterase but the cholinesterase reactivates quickly, making testing unreliable in predicting overexposure.

### \*\*\*Days to repeat test:

- For RBC ChE:  $(\% \text{ depression} - 20) / 0.83$   
= number of days to repeat test.
- For Plasma ChE:  $(\% \text{ depression} - 20) / 1.2$   
= number of days to repeat test.

*Testing weekly is also acceptable.*

Developed by:



Revised on 02/16/2023 by:

Steven Kirkhorn, MD, MPH and  
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Medicine Center external scientific advisor

# BEHAVIORAL WELLNESS

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- ▶ Women in Agriculture – Multiple roles
  - Off farm work (3<sup>rd</sup> shift phenomenon)
  - Live with risk every day
  - Work life & family life intersect 24/7
  - Lack of mental health providers
  - Lack of social support
- ▶ Review of literature supports women in farming work in multiple roles.
  - “A farm woman with an off farm job faces very difficult demands in addition to being the traditional nurturer for the rest of the family”. (Moolgaard and Miller, 1996)
    - ▶ Much has not changed in 20 years

## STRESS ON AND OFF THE FARM

# MENTAL HEALTH STATISTICS

46% of Americans will meet the criteria for a diagnosable mental health condition sometime in their life.

Anxiety disorders are among the most common mental illnesses in America.

Major depression is also one of the most common mental illnesses.

Mental Health America, n.d.-a

In rural communities, the suicide rate is between 18.3 and 20.5 per 100,000 residents, compared to large urban communities where the rate is between 10.9 and 12.5 per 100,000 (almost twice as high in rural communities).

Mental Health America, n.d.-b



# MENTAL HEALTH & Access to Care in RURAL AMERICA

People from all communities are affected by mental illness, but rural Americans often experience unique barriers to managing their mental health.



## AMONG U.S. ADULTS IN NONMETROPOLITAN AREAS, 2020:

**21%**

experienced mental illness

**6%**

experienced serious mental illness

**13%**

experienced a substance use disorder

**5%**

had serious thoughts of suicide

### ACCESS TO TREATMENT IS SEVERELY LIMITED

Among U.S. adults in nonmetropolitan areas, 2020:



with a mental illness received treatment



with a serious mental illness received treatment

Compared to suburban and urban residents, rural Americans:



must travel **2x** as far to their nearest hospital



are **2x** as likely to lack broadband internet, limiting access to telehealth

**25+**  
MILLION

rural Americans live in Mental Health Professional Shortage Areas, where there are too few providers to meet demand

### SOME POPULATIONS FACE ADDITIONAL CHALLENGES

53% of rural adults say the COVID-19 pandemic has affected their mental health:



of farmers and farmworkers



of younger adults aged 18-34

Many rural states have a postpartum depression rate higher than the national average of 13%:



Rural youth are at an increased risk of suicide, but highly rural areas have fewer youth suicide prevention services

Data from CDC, NIMH and other select sources. Find citations for this resource at [nami.org/mhstats](https://nami.org/mhstats)

NAMI HelpLine  
800-950-NAMI (6264)

f NAMI

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Instagram NAMICommunicate

www.nami.org

**nami**  
National Alliance on Mental Illness

# MENTAL WELLNESS RESOURCE



## MENTAL HEALTH AND THE IMPACT ON WELLNESS

For Farm Families



Many of the factors that affect agricultural production are largely beyond the control of the producer. Good health, including mental health, is a key factor that contributes to one's ability to keep farming.

Twenty percent of any population has mental health complications, including farmers and ranchers. Stigma and privacy concerns associated with mental health issues may mean that many people do not seek out available behavioral health services.

### SYMPTOMS OF POOR MENTAL HEALTH

- Persistent worry and fear
- Apprehensions and uneasiness
- Avoidance of others
- Feeling sad
- Lack of interest or pleasure in activities
- Significant weight change or changes in appetite
- Problems sleeping
- Slow or fidgety body movements
- Low energy
- Difficulty concentrating
- Frequent thoughts of death or suicide
- Substance misuse
- Unexplained changes in physical appearance or behavior

### EXPERIENCING ANY OF THESE SYMPTOMS?

Take the Two Question Self-Assessment Tool:

1. During the past two weeks, have you often been bothered by feeling down, depressed, or hopeless?

☐ Yes ☐ No

2. During the past two weeks, have you often been bothered by little interest or pleasure in doing things?

☐ Yes ☐ No

If you have a positive response to either of these questions, consider talking to your health care provider about further assessment. You can also access self-screening tools by visiting

<http://www.mentalhealthamerica.net/mental-health-screening-tools>

### WHEN YOU TALK TO YOUR HEALTH CARE PROVIDER:

- Be pro-active, ask about potential signs of stress, anxiety, or depression
- Speak openly about stressful issues in your work and home life
- Be familiar with your family medical history related to depression or other contributing behavioral issues
- List any prescribed and over-the-counter medications you take
- Be aware of smoking habits and alcohol intake
- Inquire about a referral to a mental health specialist
- Know what your insurance coverage may (or may not) be for evaluation of mental health care

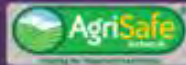




# WOMEN'S HEALTH RESOURCE

## TAKE CHARGE OF YOUR HEALTH

### Women Working in Agriculture



Across the country, women have worked in agriculture providing food for their families and communities. The number of women working as principle farmer has tripled over the past thirty years and their work habits have also changed. Women contribute to our strong farm economy and will continue to live, work and raise families on farms.

This fact sheet is designed to highlight the unique risk factors for women working in agriculture. Practical solutions are offered to assist farm women in maintaining a healthy and productive farming future.

#### GENDER DIFFERENCES AND WORK-RELATED INJURY RISK

Gender Differences	Description	Exposures/Risks	Possible Health and Safety Issues for Women
Size and Shape	On average, women are smaller than men and, as a result of body proportions (e.g., wider hips, shorter arms and legs)	Use of equipment or tools not designed for women Personal protective equipment that doesn't fit well Caring for animals	Increased risk for fractures of the bones and ligaments Increased risk for sprains Increased risk for repetitive strain injuries or other trauma Increased risk for injury to the neck, back, and hands
Strength	Upper body strength is 40-75% less and lower body strength is 5-55% less than for males	Use of equipment or tools not designed for women Moving heavy objects Caring for animals Aggression from farm animals (e.g., kicking, biting)	Increased risk for back strain and shoulder Increased risk for neck and hand Increased risk for injury to the neck, back, and hands Increased risk for injury to the neck, back, and hands
Reproductive Factors	Pregnancy and fertility often not recognized or considered when women assume farm roles	Plutonium Hazardous agents Increased risk of infection Caring for animals	Potential for fertility complications Potential impact on the fetus Contracting zoonotic disease Potential injury to fetus
Stress Factors	Work on the farm and off creating competing demands Responsibilities for management of household Childcare and aging parents/guardians	Lack of sleep Lack of exercise	Increased risk for injury Increased risk for depression, anxiety, or other psychological issues Increased risk of illness due to compromised immune system function

#### NOTES FOR TALKING TO YOUR HEALTH CARE PROVIDER

- Discuss your farm-related risks
- Ask questions related to pesticide exposure and farm-related PPE
- Discuss reproductive health
- Discuss stress levels
- Seek professional counseling for early signs of mental health issues, stress, anxiety, and depression (if needed)



#### IDENTIFY PREVENTION STRATEGIES TO ELIMINATE OR REDUCE AG-RELATED RISKS

GENDER DIFFERENCES	PREVENTION STRATEGIES
Size and Shape	<ul style="list-style-type: none"> <li>When possible work with tools and equipment designed for smaller body frames</li> <li>Be aware of surroundings and risks when working with animals</li> <li>Seek PPE designed to fit your size and shape</li> </ul>
Strength	<ul style="list-style-type: none"> <li>Wear sturdy foot attire to avoid slips, trips and falls</li> <li>Avoid repetitive motion work or modify work to reduce strain on joints</li> <li>Maintain strong bone density by appropriate calcium intake and exercise</li> </ul>
Reproductive Factors	<ul style="list-style-type: none"> <li>Read and understand information in precautionary statement on pesticides labels</li> <li>Wear appropriate personal protective equipment based on the product label or when working around animals</li> <li>Reduce exposures with proper laundering of personal or family members clothing</li> </ul>
Stress Factors	<ul style="list-style-type: none"> <li>Establish support systems which may include family, friends, online blogs</li> <li>Seek assistance from health care professional for symptoms that may indicate depression and/or anxiety</li> </ul>
GENERAL RISKS	
Exposure to heat and sun	<ul style="list-style-type: none"> <li>Wear sun safe hats and clothing</li> <li>Use sunscreen with SPF of 30 or higher at all times in all seasons</li> </ul>
Longer hair styles and ponytails	<ul style="list-style-type: none"> <li>Secure longer hair above, inside or behind to prevent entanglement</li> </ul>
Respiratory exposure	<ul style="list-style-type: none"> <li>Wear NIOSH approved 2 strip or cartridge respirator in appropriate area to fit your facial structure</li> </ul>
Chronic noise exposure	<ul style="list-style-type: none"> <li>Wear NIOSH approved hearing protection</li> <li>Choose hearing protection type and comfort to fit your ear canal</li> </ul>





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Recommendations are based off your interests. To update your interests, visit your [Profile](#).

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# Agricultural Medicine

*Rural Occupational and Environmental  
Health, Safety, and Prevention*

SECOND EDITION

KELLEY J. DONHAM AND ANDERS THELIN



WILEY Blackwell

# If you serve agricultural communities, you should take FarmResponse®



## Course Description:

FarmResponse is a **3.5-hour on-demand continuing education module** that provides the full range of competencies necessary to provide **appropriate mental healthcare for agricultural producers and their families.**

This knowledge is critical for healthcare professionals across all disciplines who serve rural communities.



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For more information on FarmResponse, scan the QR code or visit: [agrisafe.org/farm-response](https://agrisafe.org/farm-response).

If you have any questions, reach out to:  
[info@agrisafe.org](mailto:info@agrisafe.org).



# QPR FOR FARMERS AND FARM FAMILIES

Free suicide prevention training for members of agricultural communities

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QPR is a mental health crisis intervention and suicide prevention model, which stands for Question, Persuade, and Refer.

- 1.5 hour training online or in-person
- Discusses the unique challenges farmers face that can lead to stress, depression, and suicide
- Teaches community members how to help at-risk individuals by implementing QPR



**agrisafe.org**

Scan the QR code for more  
info and training dates!





# Get engaged with AgriSafe!



**Join our contact list**  
to hear about upcoming  
trainings and more!



**Donate to support AgriSafe's work**  
No donation is too small, and you  
can select which AgriSafe initiatives  
you would like to support!



**Become a member**  
to get access to member-exclusive  
discounts, unlimited access to CE  
offerings, and more!

Stay in touch!



**Stay in touch**  
and follow our  
socials!



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