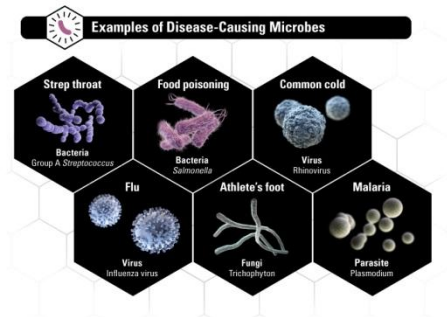


# Pennsylvania's Response to the Threat of Resistance

Dr. Rachel Levine  
Pennsylvania Physician General

# Antimicrobial Resistance (AMR)

Antimicrobial resistance (AMR) is the change in microbes (e.g. bacteria, parasites and fungi) which enable them to withstand treatment by antimicrobial drugs, meaning that the drugs no longer work, or work less effectively



Source: CDC



Source: Imperial College

# Antimicrobial Resistance (AMR)

The recent discovery of a plasmid-borne colistin resistance gene, *mcr-1*, heralds the emergence of truly pan-drug resistant bacteria



Colistin-resistant E. Coli infection; female 46 yrs old Pa. patient in 2016

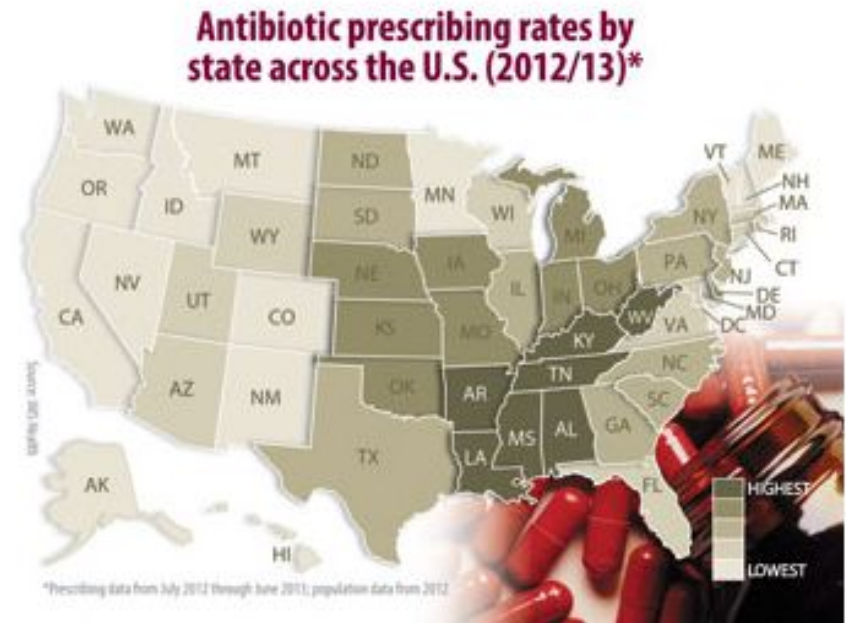
# ▶ What drives AMR?

## National Prescription Rates

- **262.5 million** courses of antibiotics prescribed by health care providers in 2011
- **842** prescriptions per 1000 persons

## Overuse of Abx in animals

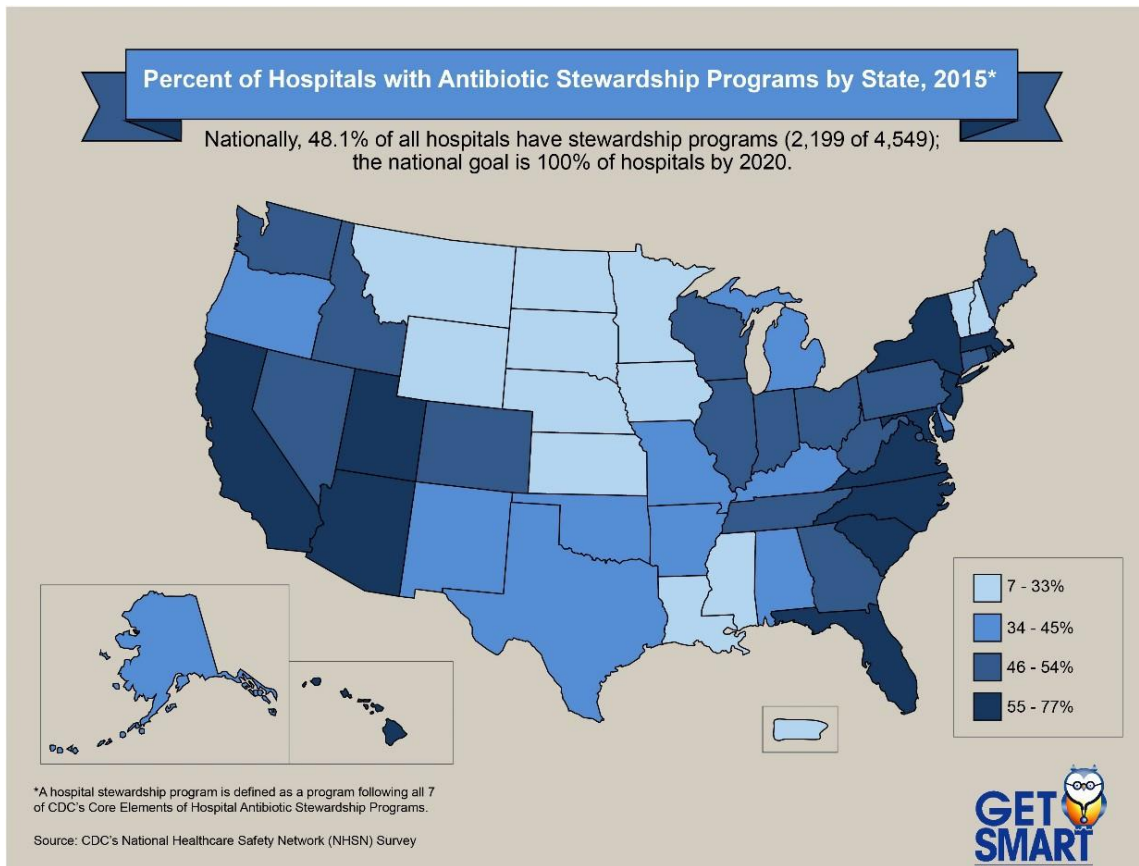
- $\geq 60\%$  of medically important antimicrobials are used in animals\*



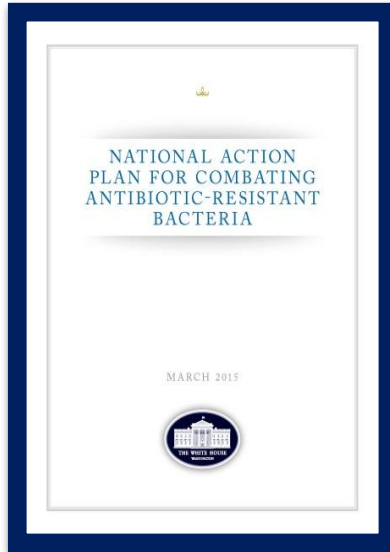
Source: Hicks L, et al. US Outpatient Antibiotic Prescribing Variation According to Geography, Patient Population, and Provider Specialty in 2011. *Clinical Infectious Diseases*. 2015; 60(9):1308-16

Source: \*FDA Report on antimicrobials sold in 2014

# What drives AMR?



# Overview of Commonwealth Response



## GOAL 2. Strengthen National One-Health Surveillance Efforts to Combat Resistance

Actions taken to achieve Goal 2 will fulfill:

- **Executive Order 13676, Section 6:**
  - *Strengthening National Surveillance Efforts for Resistant Bacteria*
- Provisions in **PCAST Recommendations #2 and #6:**
  - *Effective Surveillance & Response for Antibiotic Resistance*
  - *Improving Stewardship of Existing Antibiotics in Health Care*

# Overview of Commonwealth Response

- Pennsylvania Get Smart Program
  - Antimicrobial stewardship



- Program for monitoring antimicrobial resistance



# Get Smart Program Objectives

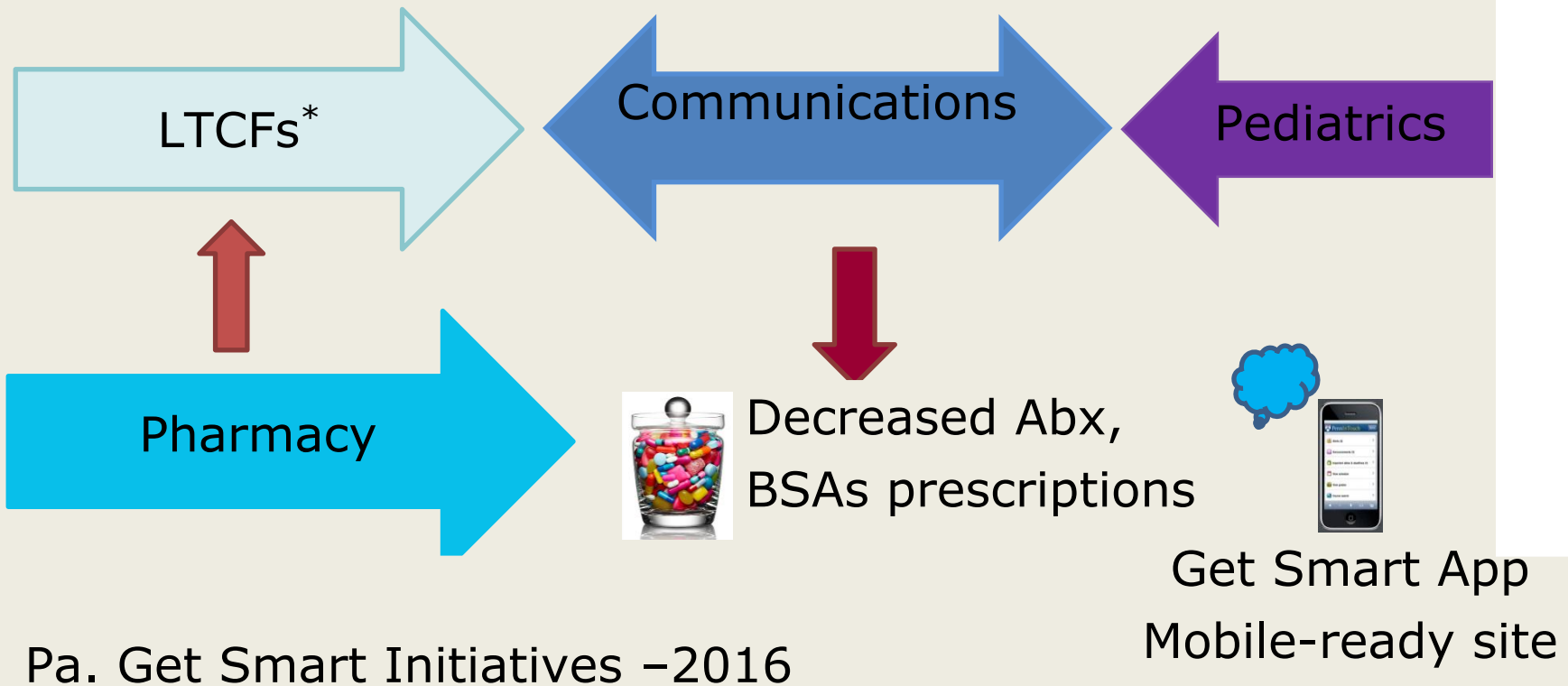
- Promote guidelines for antimicrobial stewardship
- Estimate antibiotic prescriptions
- Decrease consumer demand for unnecessary antibiotics
- Increase prevention activities (vaccination and hygiene)



CDC Image Library



# Get Smart Program Initiatives



\* Long Term Care Facilities

# Pediatric Initiative

## Pediatric settings

- Pediatric clinics Abx stewardship
  - Promote Get Smart guidelines
  - Reduce parental expectations for Abxs
- Collaborations
  - Penn State Hershey Pediatrics
  - Children's Hospital of Pittsburgh
- Focus
  - Childcare facilities
    - ~7907 facilities
    - ~242,324 children in childcare facilities<sup>3</sup>



Source: [www.examiner.com](http://www.examiner.com)

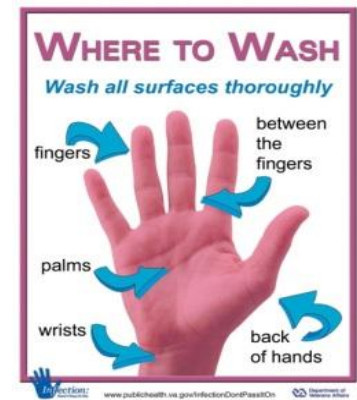
# Get Smart Pediatric Initiative (continued)

## Primary prevention

- Hand hygiene demonstrations are held in child care centers and schools



Dr. Levine reading "Katie Caught a Cold" to children at a child care center in State College, Pa.  
November 17, 2015




# Get Smart Pharmacy Initiative

## Objectives

- Engage faculty and students in antimicrobial stewardship
  - Outreach in community pharmacies
- Research on antibiotic prescribing trends
- Collaborator: University of Pittsburgh School of Pharmacy

You have just filled a prescription for an antibiotic...




**READ THIS IMPORTANT INFORMATION**

- ✓ Take it exactly as your medical expert tells you
- ✓ Do not skip doses
- ✓ Do not share it with others
- ✓ Finish the prescription even if you feel better
- ✓ Do not save it for later

**Why is this checklist so important?**  
Using an antibiotic the wrong way can make infections stronger and harder to treat. You can prevent this problem by getting smart about antibiotics.

**Take antibiotics the right way.**



For more information call  
1-800-CDC-INFO or visit  
[www.cdc.gov/getsmart](http://www.cdc.gov/getsmart)

# Get Smart Pharmacy Initiative (cont'd)

## Examples of activities

- Annual Get Smart workshop
  - Get Smart CDC and State perspective, since 2014
  - Online course "Community Pharmacists Tip the Scales"<sup>4</sup>
  - ~110 students outreach in ~75 com. pharmacies in Allegheny county each year
  - Over 2000 encounters since 2014
- Community outreach
  - Abx quiz, feedback and Get Smart brochures



Josh Krise and Melanie Beers:  
Class of 2018 and Christine  
Murphy, DOH; Source: NM

4. CDC: Weighing in on Antibiotic Resistance  
(available at [www.cdc.gov](http://www.cdc.gov))

# Get Smart Communication Initiative

## Objectives

- Disseminate guidelines and training materials
  - Get Smart Web portal
  - Social media Facebook, Twitter
  - Monthly newsletter
- Conduct behavioral research on drivers of abx use
- Coordinate Get Smart Week and One Health forums

The screenshot shows a webpage from the Perelman School of Medicine. The page title is "Childcare and Antibiotics: Know When to Say No". The navigation bar includes links for HOME, ANTIBIOTIC RESISTANCE, HAND HYGIENE, IMMUNIZATIONS, TRAINING RESOURCES, PUBLICATIONS, and CONTACT. There are social media icons for Facebook and Twitter, and a "JOIN THE MOVEMENT" button. The main content area features a puzzle graphic with four pieces labeled "Provider's Connection", "Teacher's Room", "Parents' Forum", and "Kids' Hangout". Below the puzzle, there is a section titled "Director's Corner" with text about childhood respiratory illnesses and antibiotics. To the right, there is a section for the "2016 Get Smart Art Competition" with a deadline of October 31, 2016. The page also includes a "2016 Information" section with links for "2016 Press Release", "2015 Winners", and "2015 Award Ceremony Booklet".



# Get Smart Communication Initiative

## Examples of activities and outcomes

- Get Smart Week
  - Governor's Proclamation, 2015
    - First seminar at Penn State Nov
    - ~300 participants, Student Health Services
- Get Smart Award Ceremony
  - 18 award recipients March 2016
  - 100 participants—parents, kids, legislators



Lydia Glick- Penn State Student

# Tracking Antimicrobial Resistance (continued)

## **Tracking antimicrobial resistant foodborne bacteria—e.g., *Salmonella***

- Clinical isolates analyzed in collaboration with CDC and Pa. Vet Lab
- Enteric bacteria in retail meat in collaboration with FDA

## **Next generation whole genome sequencing (WGS)**

- An advance over PFGE —WGS is a more precise method to identify related bacterial strains—important for outbreak tracing
- Collaborative initiatives: DOH and Penn State College of Ag Sciences

## **Tracking Carbapenem-Resistant Enterobacteriaceae (CREs) in collaboration Un. Pennsylvania and CDC**



# Call to Action

**ANTIBIOTIC  
RESISTANCE**



**WHAT CAN  
HOSPITAL &  
CLINIC  
MANAGERS DO?**

- Prevent spread of pathogens within healthcare settings
  - Ensure staff ALWAYS clean their hands, instruments & environment at key junctures during care
  - Major administrative and clinical leadership investment needed to improve infection prevention practices
- Promote antimicrobial stewardship programs
- Conduct surveillance for antibiotic-resistance pathogens--timely, actionable data

# Call to Action

## For Providers

- Prevent infections by ensuring clean environment, hands, stethoscopes, and other medical equipment
- Judiciously prescribe antibiotics.
  - Prescribe ABX only when they are needed
  - Narrow-spectrum ABX whenever possible
  - The appropriate dose for the appropriate duration
- Keep patient vaccinations up to date



Credit: NIH

# 2016 Get Smart Art Competition Winners

# Age Group <4



**First place**

Kailee Park

Age 4

Lorton, VA



**Second place**

Landon Moran

Age 4

Palmyra, PA



**Third place**

Kendal Rank

Age 3

Dillsburg, PA

# Age Group 5-6

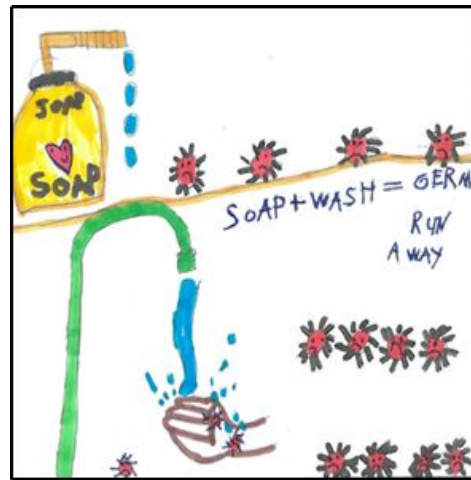


**First place**

Wyatt Lentz

Age 5

Camp Hill, PA



**Second place**

Aanya Govil

Age 6

Mechanicsburg,  
PA



**Third place**

Alexa Park

Age 6

Dillsburg, PA

# Age Group 7-8



**First place**

Avery Moran

Age 8

Palmyra, PA



**Second place**

Romello Torres

Age 8

York, PA



**Third place**

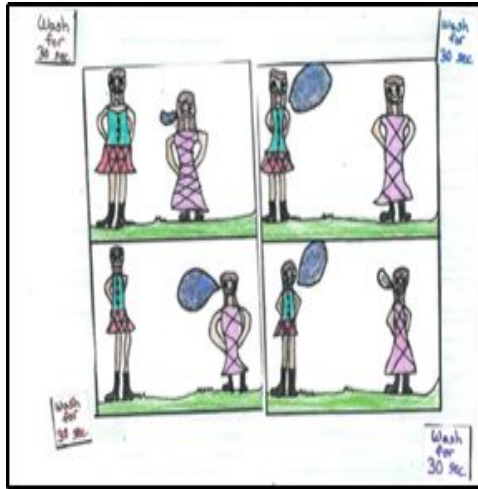
Naila Nicholson

Age 8

Lancaster, PA



# Age Group 9-10



**First place**  
Sarah Watson  
Age 9  
Atglen, PA



**Second place**  
Ian Lentz  
Age 9  
Camp Hill, PA



**Third place**  
Alyson Park  
Age 9  
Lorton, VA

# Age Group 11-12



**First place**  
Courtney Keller

Age 11

Kennett Square, PA



**Second place**  
Madyson Isenhour

Age 11

Harrisburg, PA



**Third place**  
Keegan Carter Tilley

Age 12

Harrisburg, PA



# Acknowledgment – PCAS Team



**Nicole Hackman**  
Penn State Hershey  
Medical Group



**Erina MacGeorge**  
Penn State  
CASHDF & CIDD



**Anne Dodds**  
Keystone STARS



**Rachel Smith**  
Penn State  
CASHDF & CIDD



**Kristin Sznajder**  
Penn State  
Hershey PHS



**Jennifer Han**  
U Penn ID/CCEB

*Team* means **T**ogether **E**veryone **A**chieves **M**ore!

~Author Unknown



**Ed Dudley**  
**Meropol**  
Penn State  
CAS/Food Sc.



**Bonnie Falcione**  
University of  
Pittsburgh  
School of  
Pharmacy



**Chris Carr**  
MIT/Harvard



**Mary Leonard**  
Web Designer  
Perelman  
School of  
Medicine



**Nkuchia M**  
AR  
Epidemiologist



**Abby Kraus**  
Get Smart  
Volunteer



**Tabitha Reefer**  
Get Smart  
Public Health  
Consultant

# Acknowledgements

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- PA Bureau Epidemiology – Sharon Watkins, Ram Nambiar, Kirsten Waller
- PA Bureau of Labs, James Lute, Lisa Dettinger and Bridgette Husband
- Allegheny County Health Department – Karen Hacker and Jenn Fidnner
- Children’s Hospital of Pittsburgh – Marian Michals and Michael Green

# ➤ Acknowledgement

- Get Smart Week Speakers

Michael Katzman, George McSherry, Jeffery Gerber, Andrew Read, Marian Michaels, David Wolfgang and Robin Oliver

# 2016 Annual Get Smart Week Antibiotic Stewardship in Pennsylvania

University of Pittsburgh  
O'Hara Student Center  
Friday, Nov. 18, 2016  
Noon – 1:30 p.m.

