VPDs in Arizona

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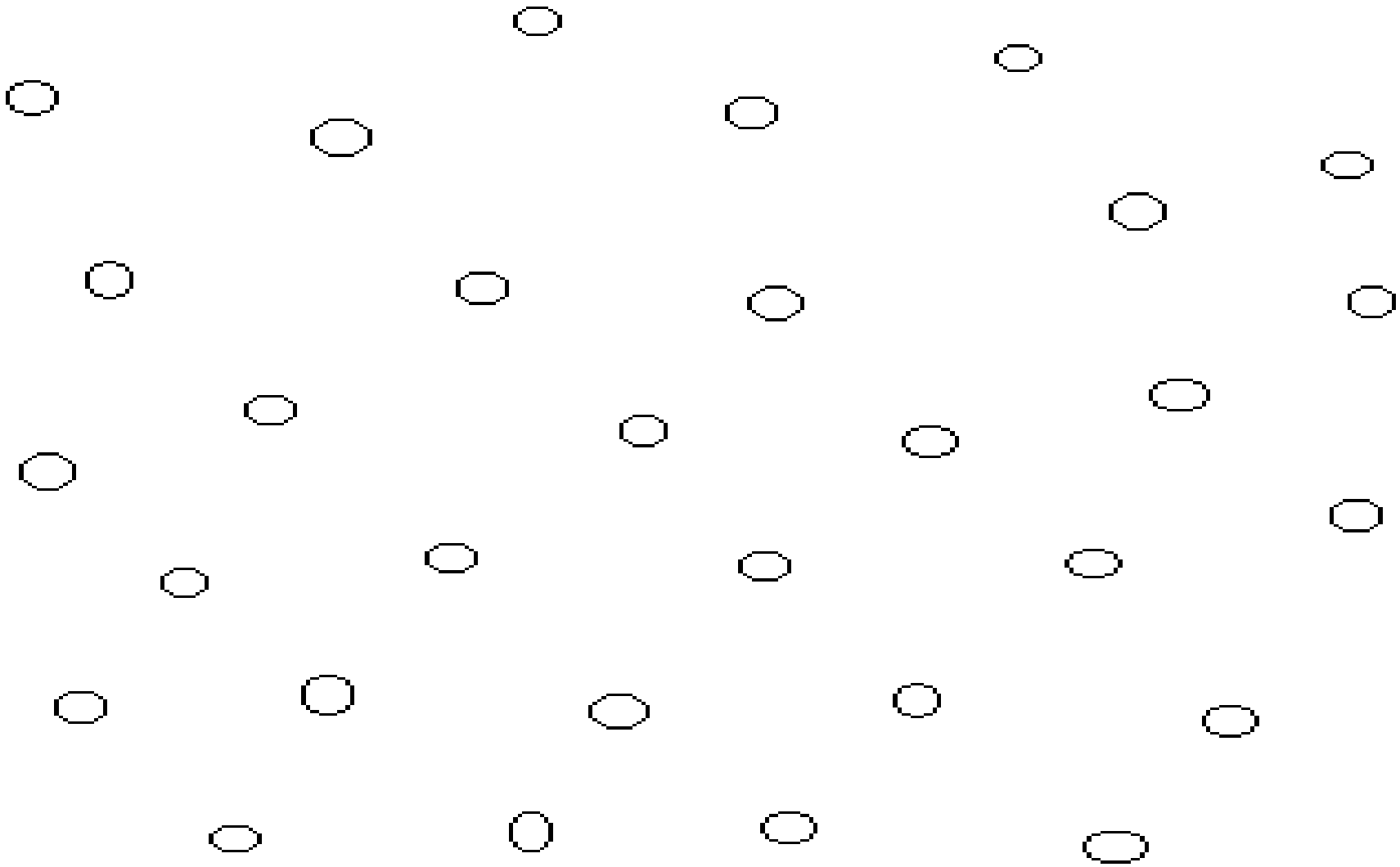
Department of Public Health

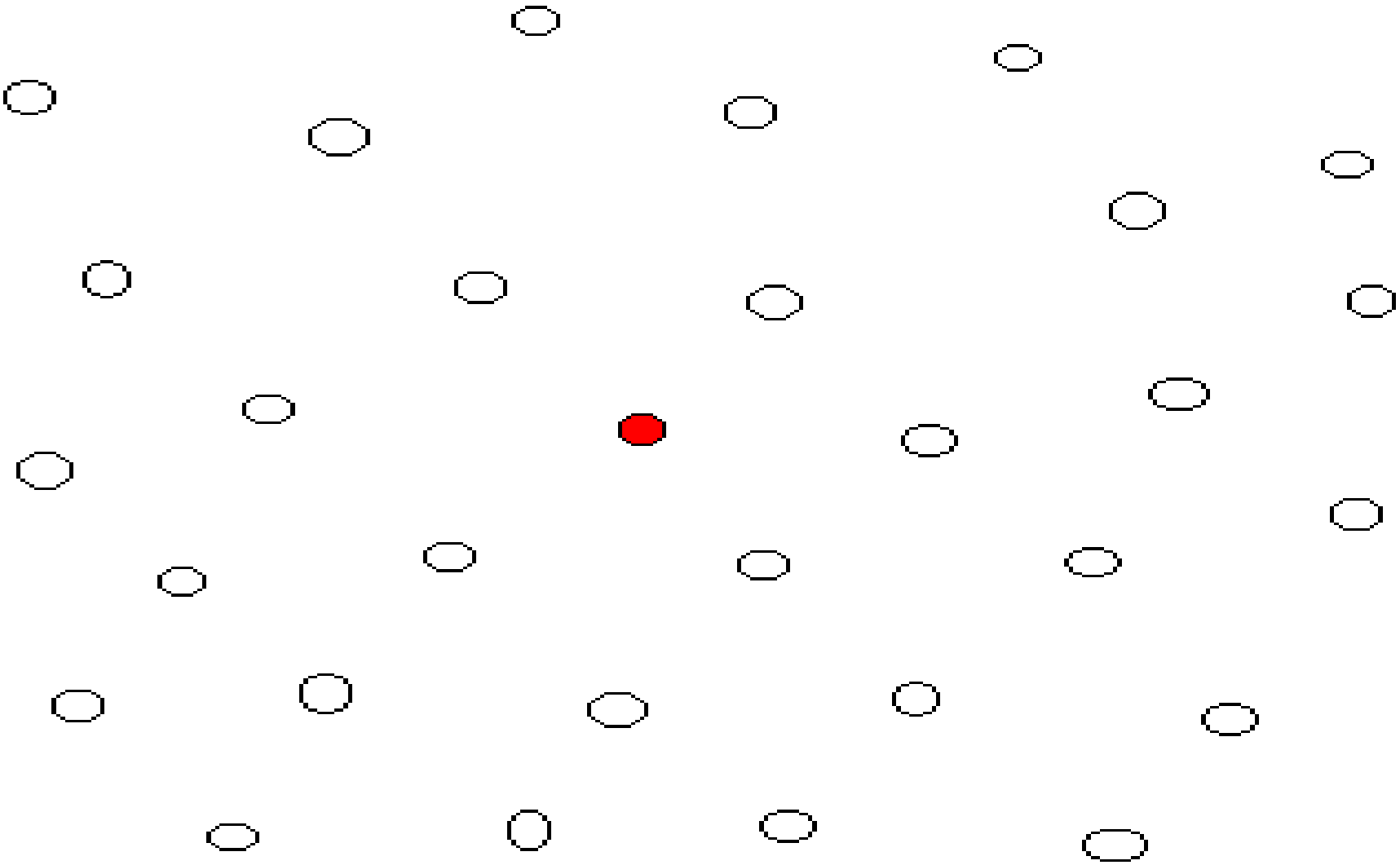
What the Heck is Going On Here?

- How vaccines really work
- How life is so different today
- What we're missing out on, still
- Vaccine opposition / hesitancy
- When we become our own worst enemy
- What we risk

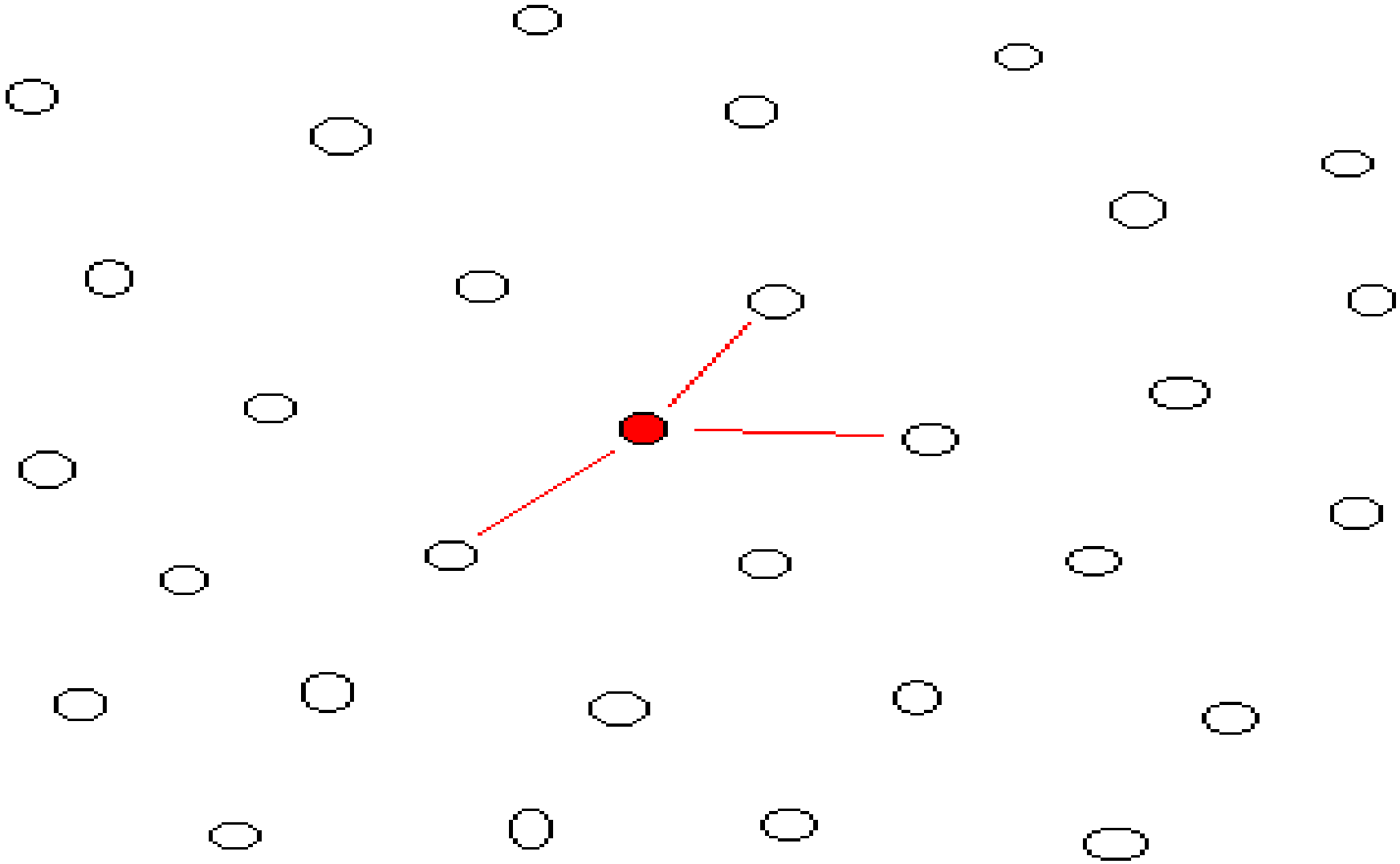
How Vaccines *Really* Work



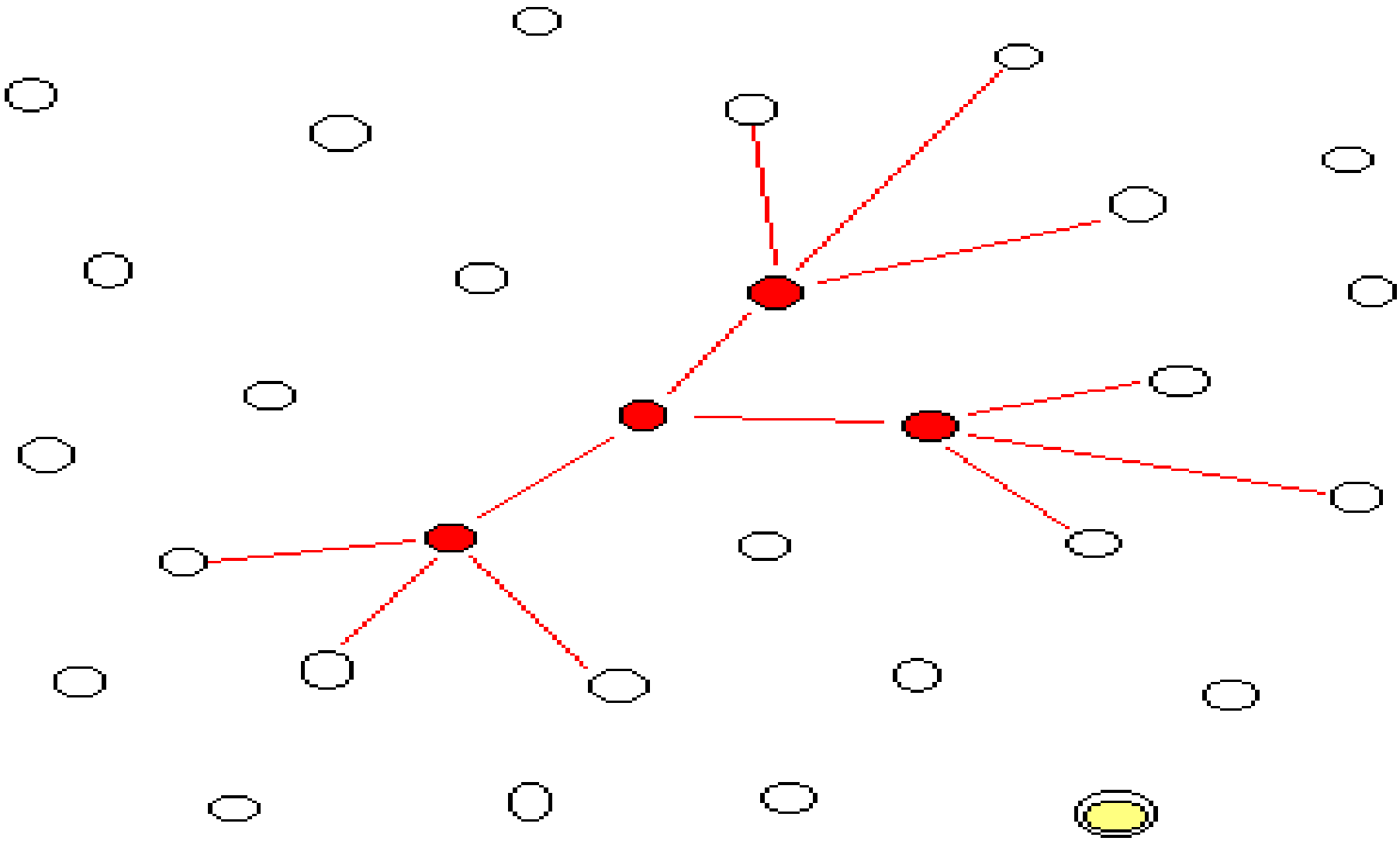
One of us gets a disease



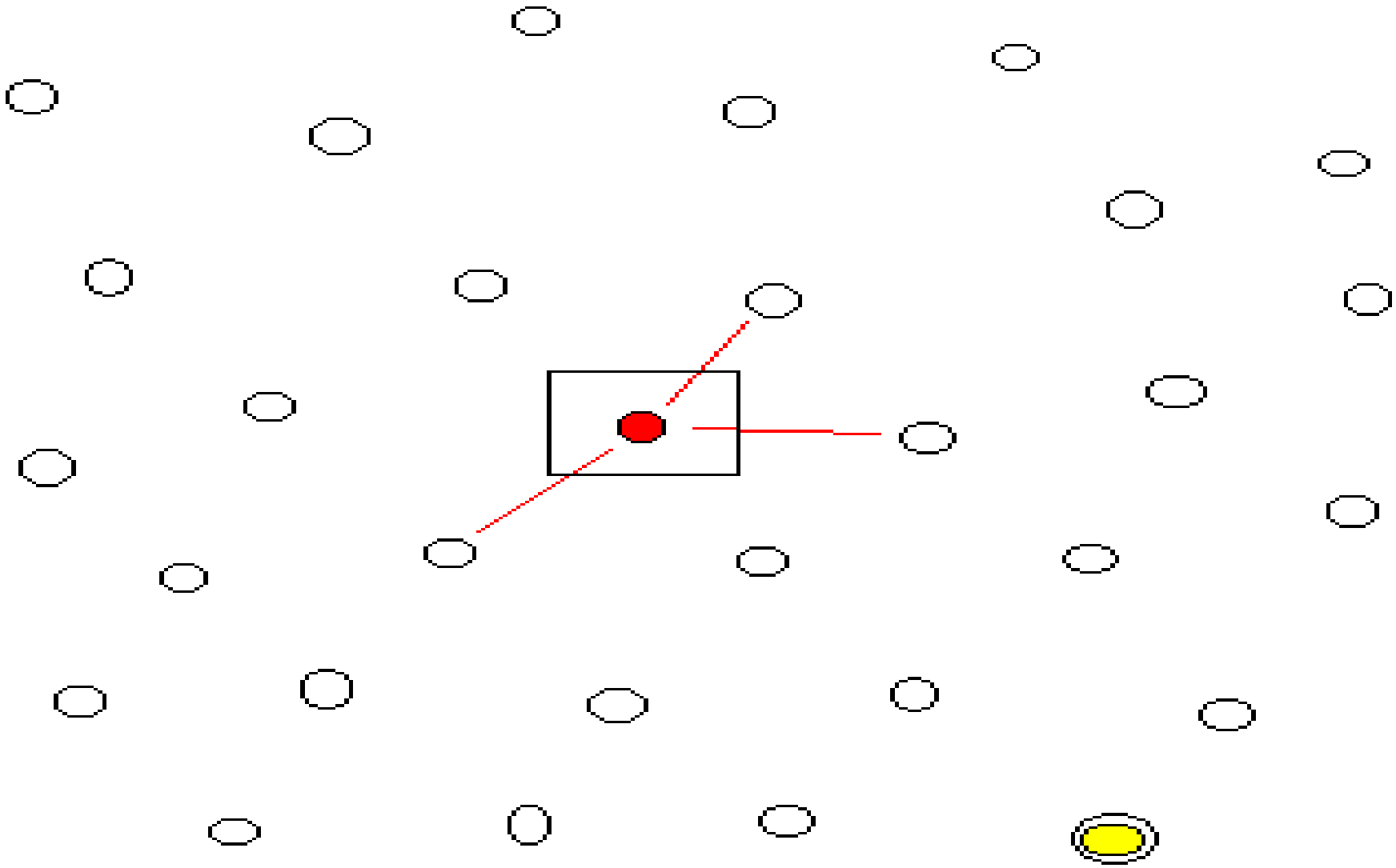
And we're off…



And from there to others…



Building walls around disease



Ways to Build Walls

- Literally “build walls” (isolate)
- Treat cases to render noninfectious
- Treat contacts to cut off incubating disease
- Immunizations
- Behavior change
- Render environment less facilitating of transmission (e.g., sanitary conditions)
- Policy decisions that are less facilitating of transmission (e.g., access to health care)

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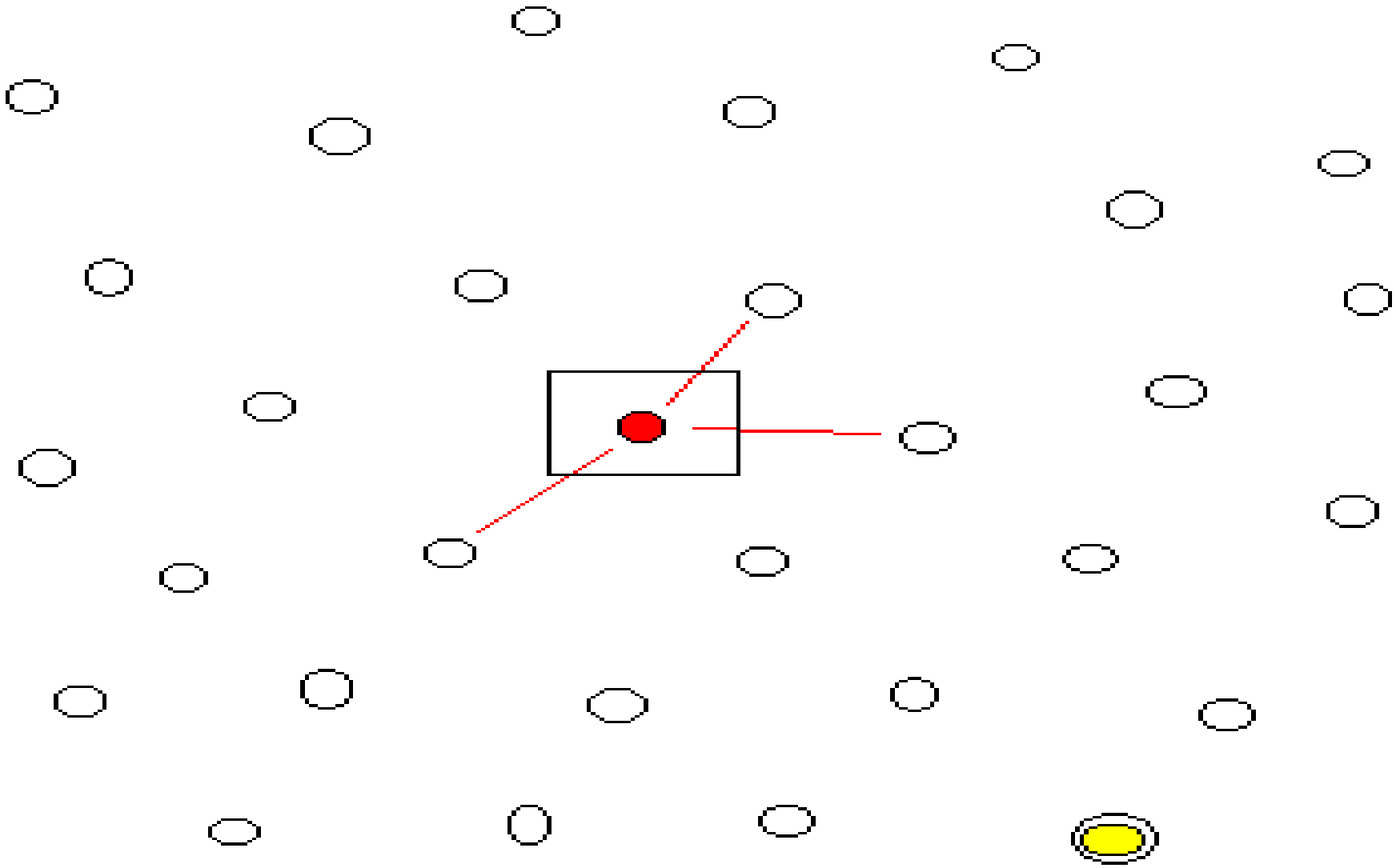
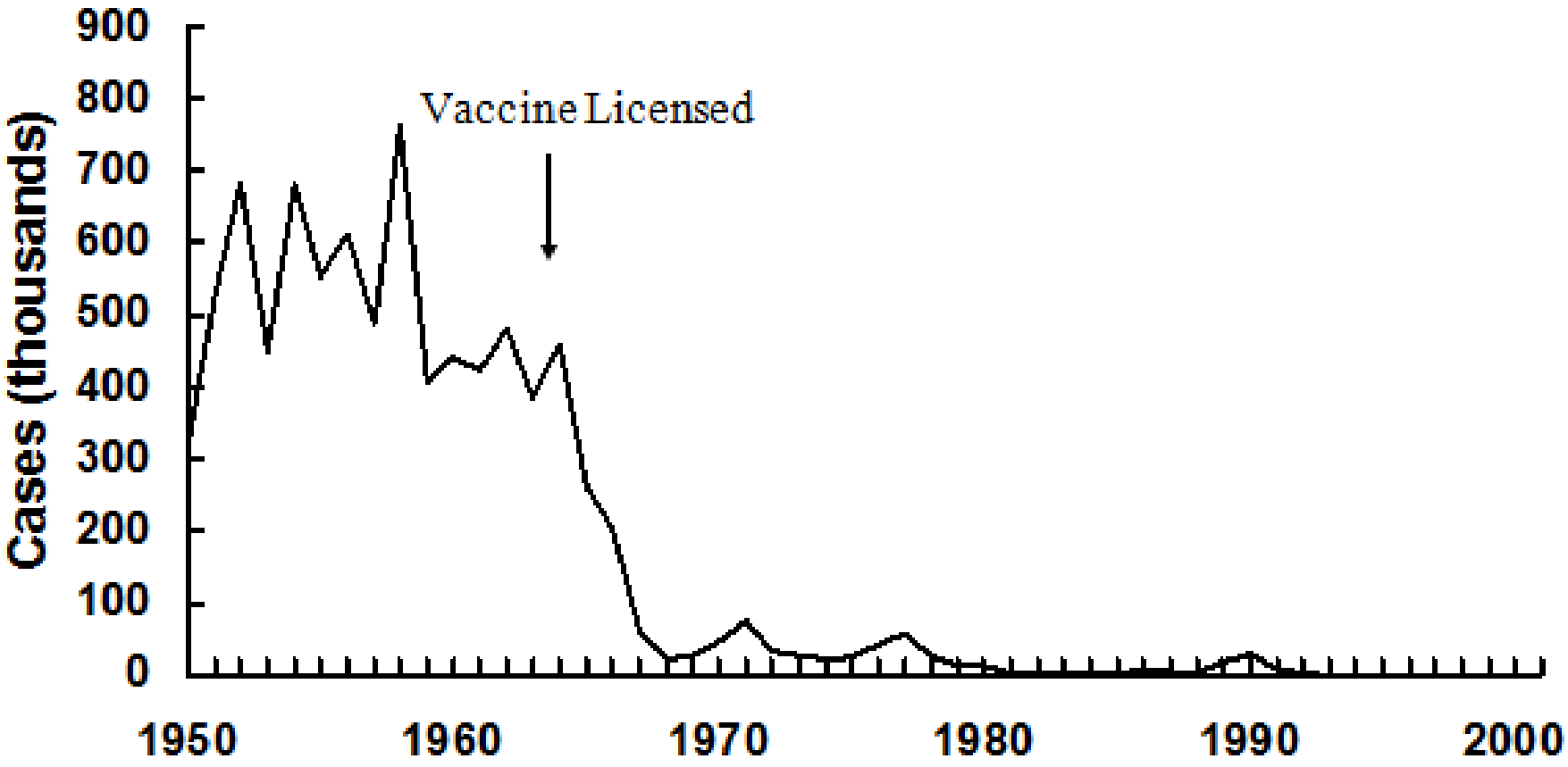
“Herd Immunity”



Measles in the US



How Different Life is Today

Comparison of 20th Century Annual Morbidity & Current Morbidity

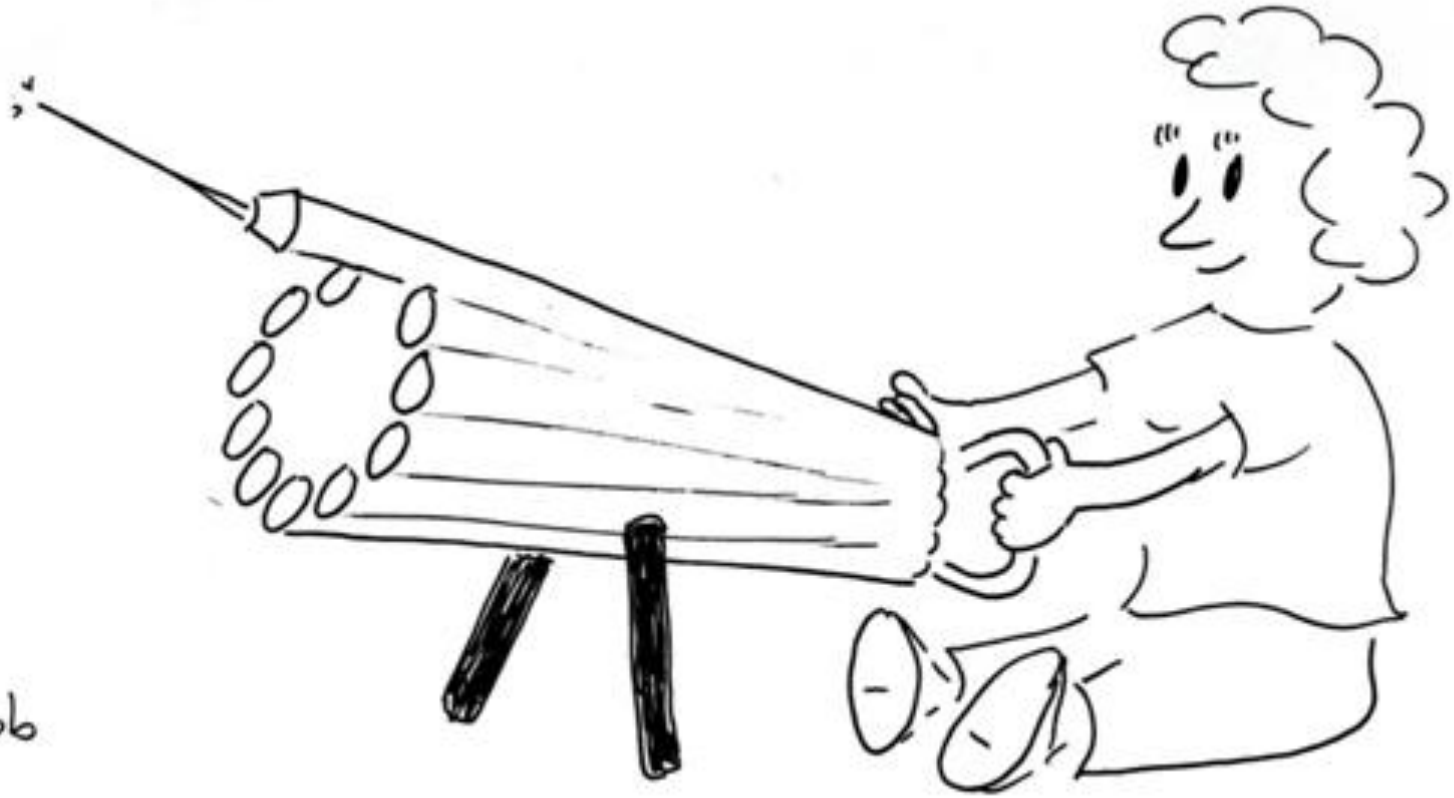
Disease	20th Century Annual Morbidity*	2010 Reported Cases†	% Decrease
Smallpox	29,005	0	100%
Diphtheria	21,053	0	100%
Pertussis	200,752	21,291	89%
Tetanus	580	8	99%
Polio (paralytic)	16,316	0	100%
Measles	530,217	61	>99%
Mumps	162,344	2,528	98%
Rubella	47,745	6	>99%
CRS	152	0	100%
Haemophilus influenzae (<5 years of age)	20,000 (est.)	270 (16 serotype b and 254 unknown serotype)	99%

Sources:

* *JAMA*. 2007;298(18):2155-2163

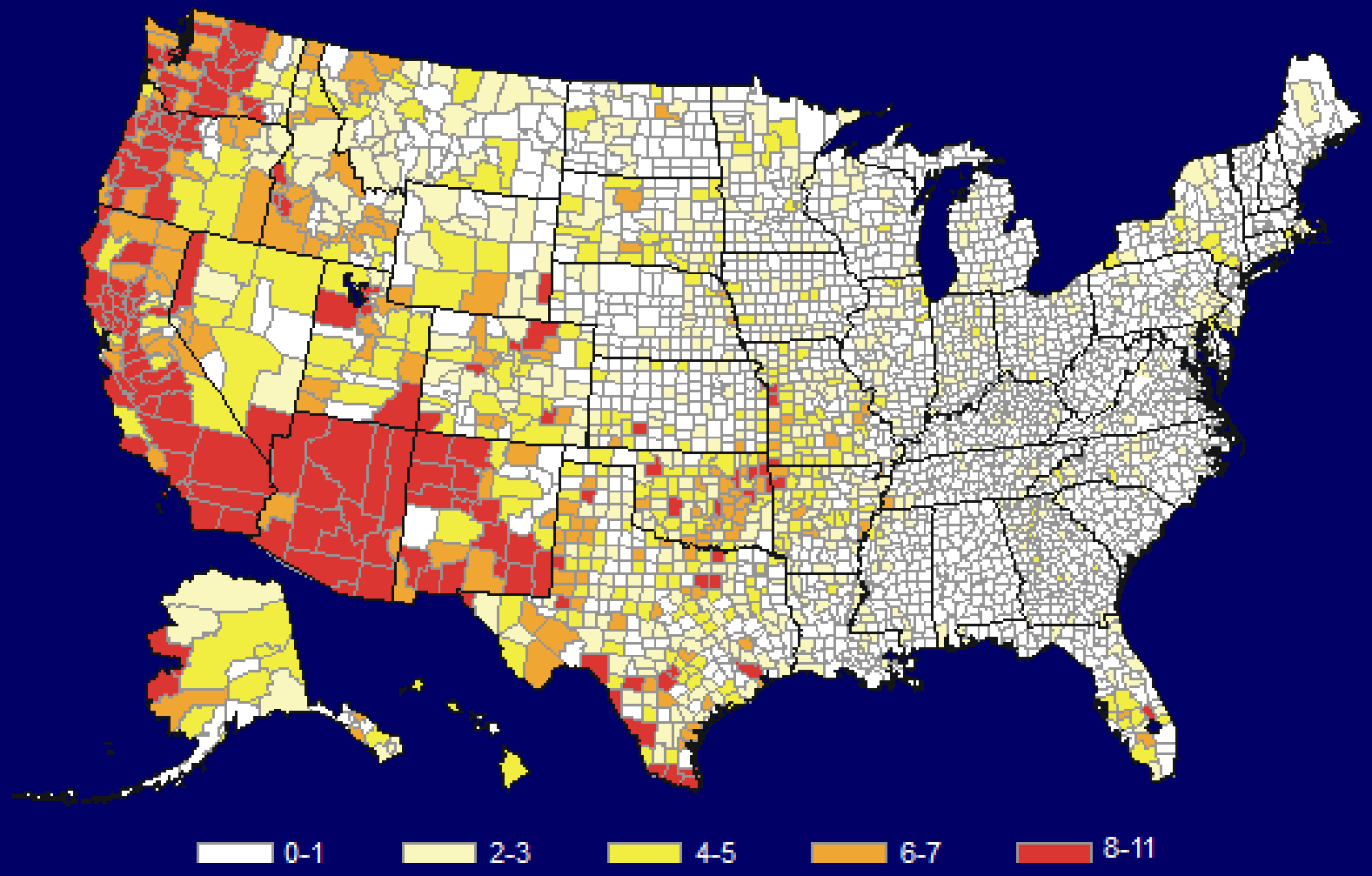
† CDC. *MMWR* January 7, 2011;59(52);1704-1716. (Provisional *MMWR* week 52 data)

The Gatling Syringe



- Dr. Bob

NUMBER OF YEARS REPORTED INCIDENCE OF HEPATITIS A EXCEEDED 10 CASES PER 100,000, BY COUNTY, 1987-1997



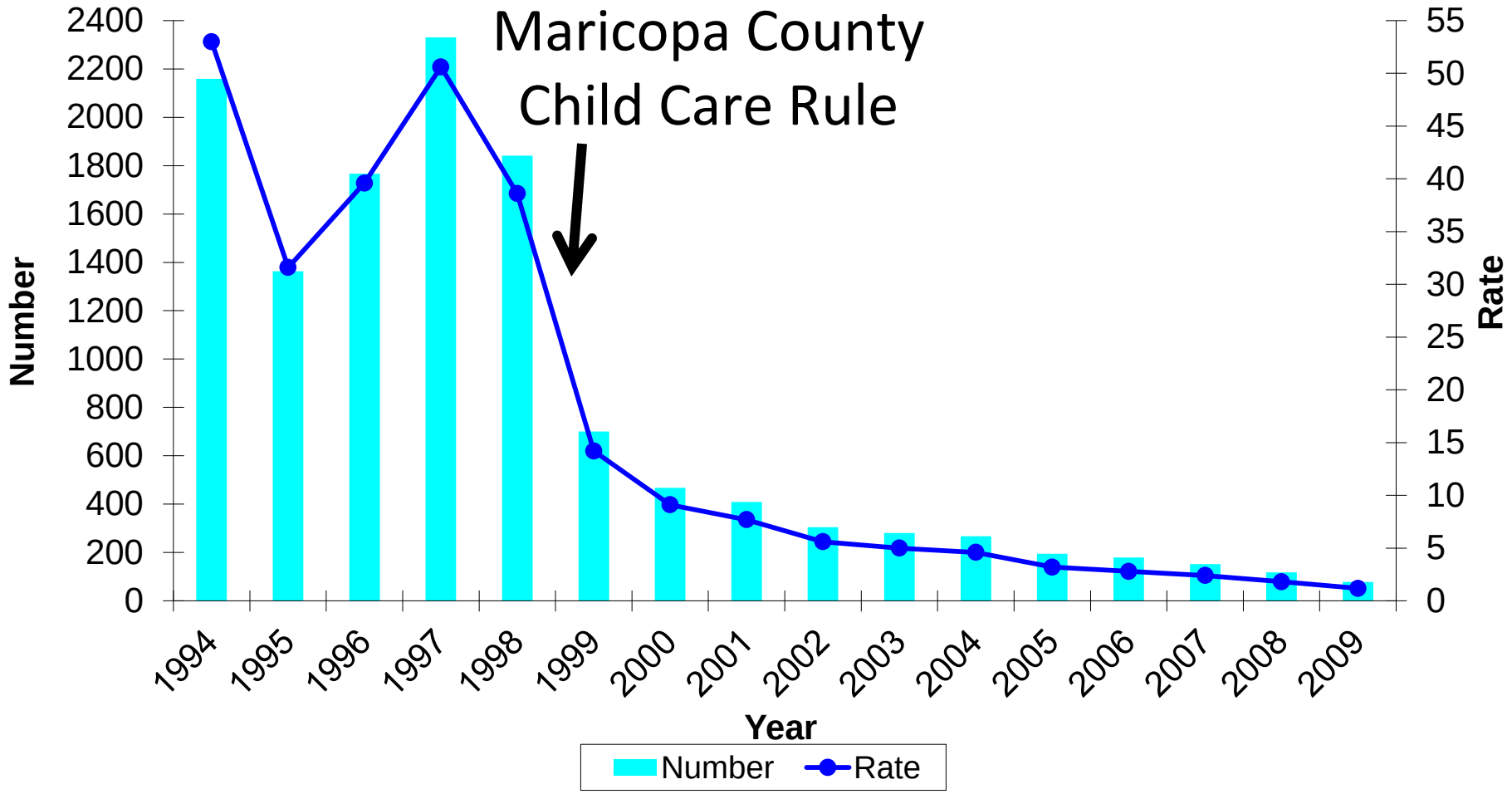
Sweet,
Innocent,
Adorable,
Filthy

Hep A control via Child Care

- 1997: 51% of cases vs. 18% of controls:
  - attended or worked in child care (direct contact, OR 6.0, 95% CI 2.1-23.0) , *or*
  - were a household contact of such a person (indirect contact, OR 3.0; 95% CI 1.3-8.0)
- 1998: Day care vaccination requirement
- 1999: No longer associated with day care
  State rate drops 6-fold, from 48 to 8/100K

Venczel CV et al. *Pediatrics* 2001;108:E78; Duggirala HJ et al. *Pediatr Infect Dis J* 2005;24:974-8.

AZ Hep A Cases & Rates



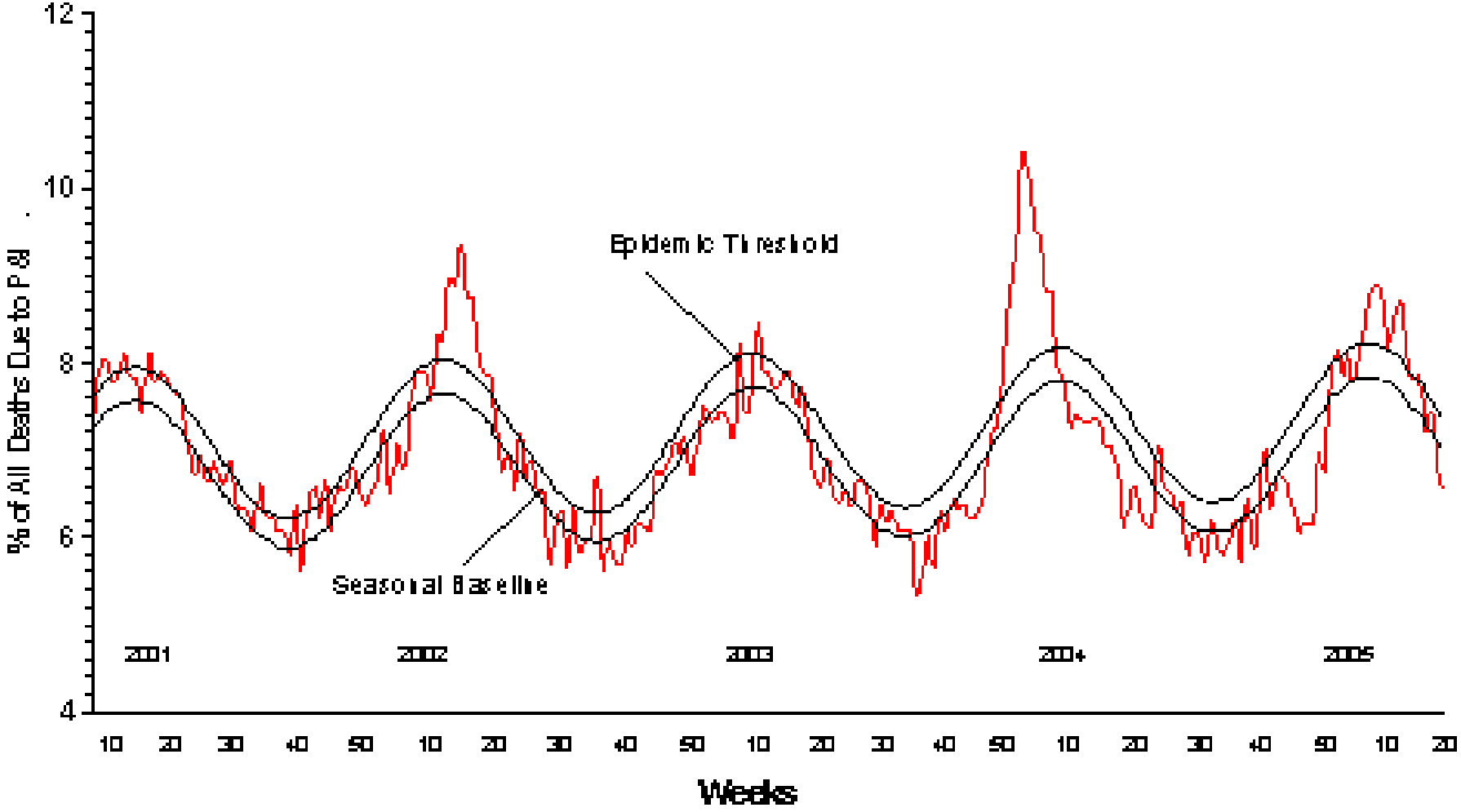
CDC Hep A Vaccine Recommendations

- International travelers
- Close contact with an international adoptee from a country of high or intermediate endemicity
- Men who have sex with men
- Persons who use illegal drugs
- Persons who have a clotting factor disorder
- Persons with occupational risk
- Persons with chronic liver disease
- Child care centers: not routinely recommended

But We Miss Opportunities *Still*

Pneumonia and Influenza Mortality for 122 U.S. Cities

Week Ending 5/21/2005



No Small Potatoes: Flu in the US

- Cases: 25 – 50+ million cases
- Infection rate 7% to 20% of general pop
  (among kids 5-14 y.o. 16% to 38%)
- Days of illness: 100 – 200 million days
- Work loss: ~75 million days
- Hospitalizations: >200,000 (57% < 65 y.o.)
- Deaths (avg in 1990s): ~1k-50k (~24k avg)
- Costs: ~$3-5 billion

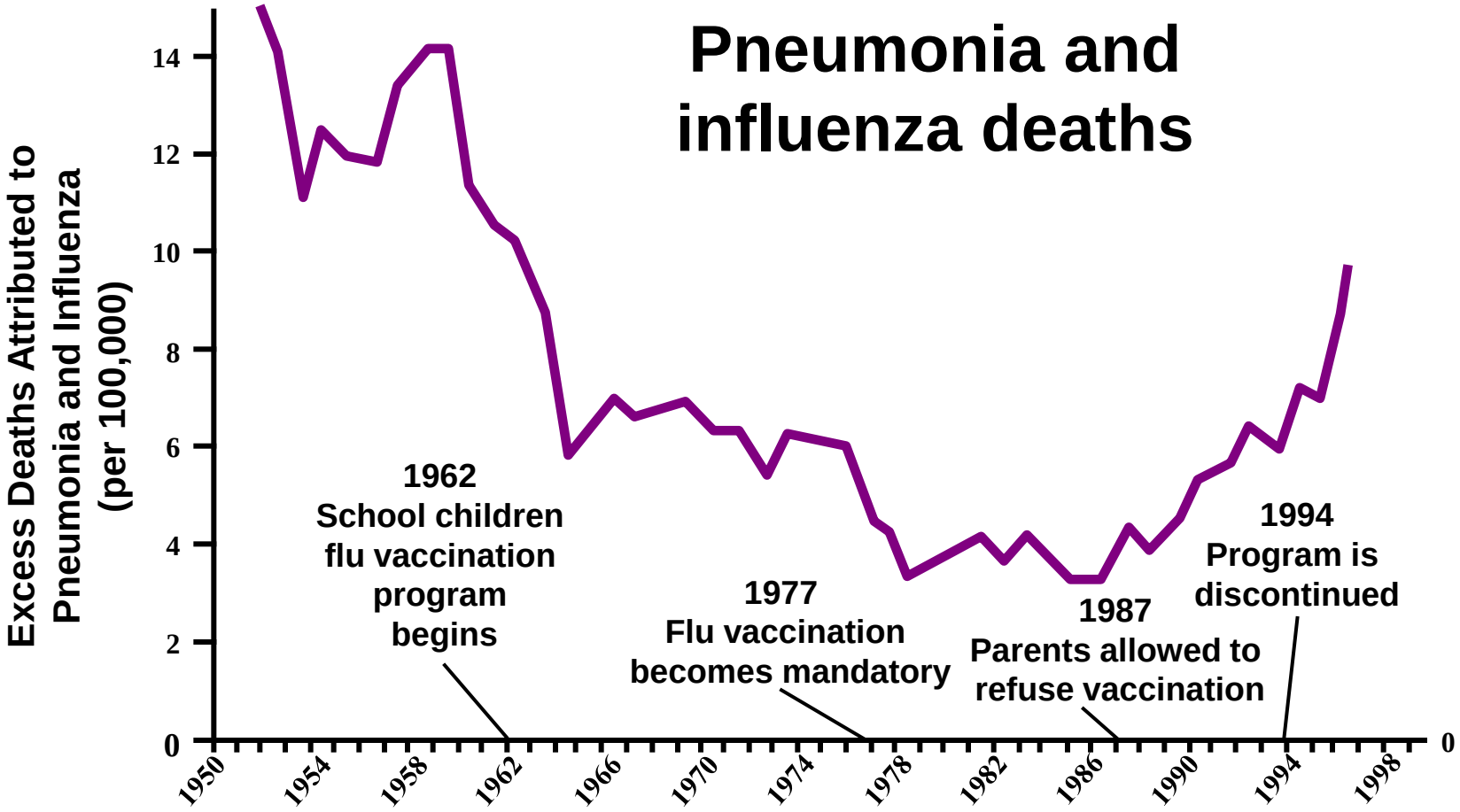
MMWR 2003; 52 (RR-8); Thompson et al. JAMA 2003; 289: 179;
Adams PF et al. Vital Health Stat 1999; 10(200).
ACIP (Advisory Committee on Immunization Practices). *MMWR.* 2004/Apr 30;53:1-40.
AAP (American Academy of Pediatrics). *Pediatrics.* 2004/May;113:1441-47.
Sullivan K. *Pharmacoeconomics.* 1996;9 (Suppl 3):26-33.

Influenza Vaccine Efficacy

- Much greater for young healthy adults than for >65 yrs
- Yet older adults among highest risk
- >65 yrs is our most vaccinated group

GESUNDHEIT!
SORRY...
-Dr. Bob

Mass Vaccination of Children in Japan Reduced Overall Deaths



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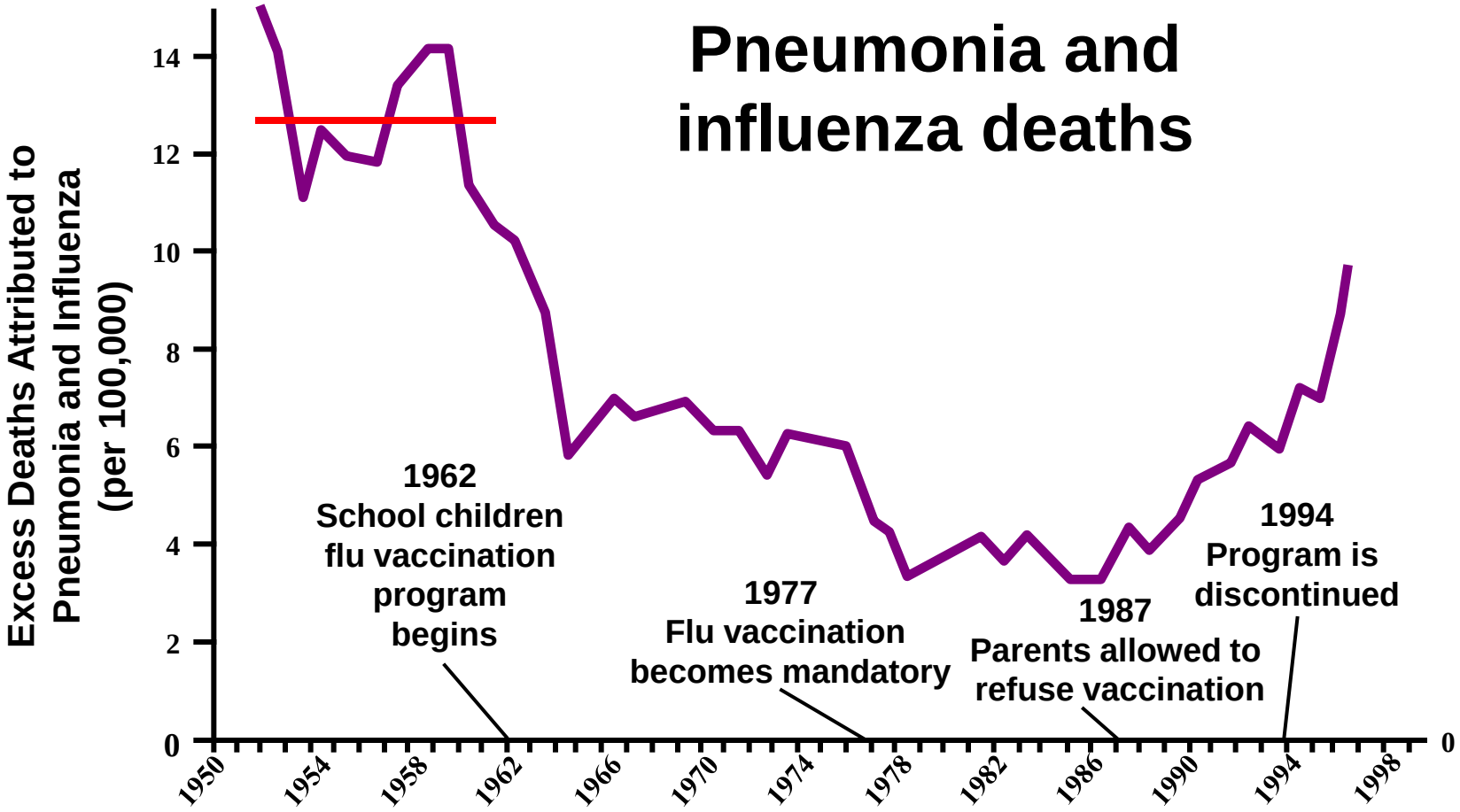

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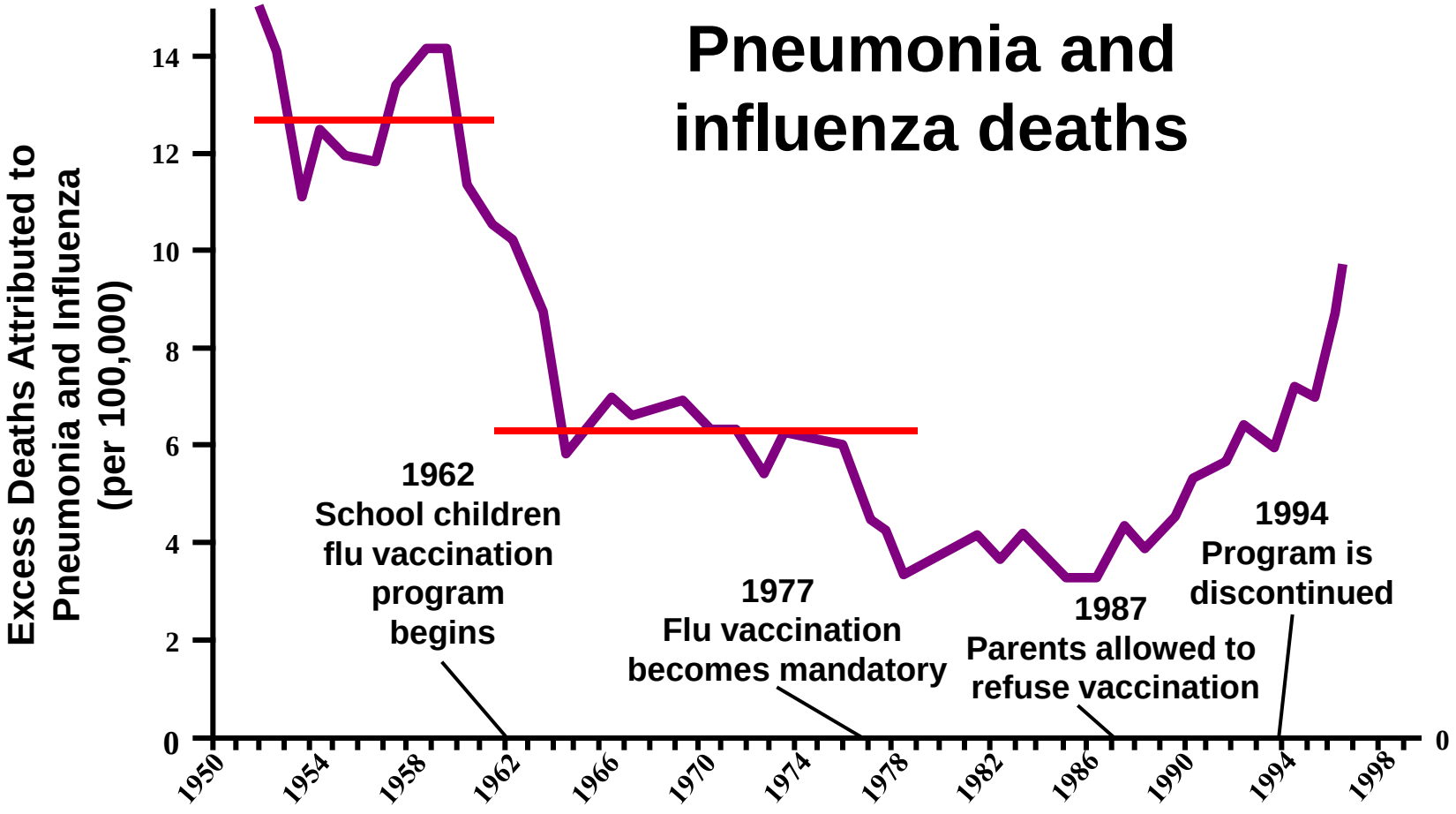

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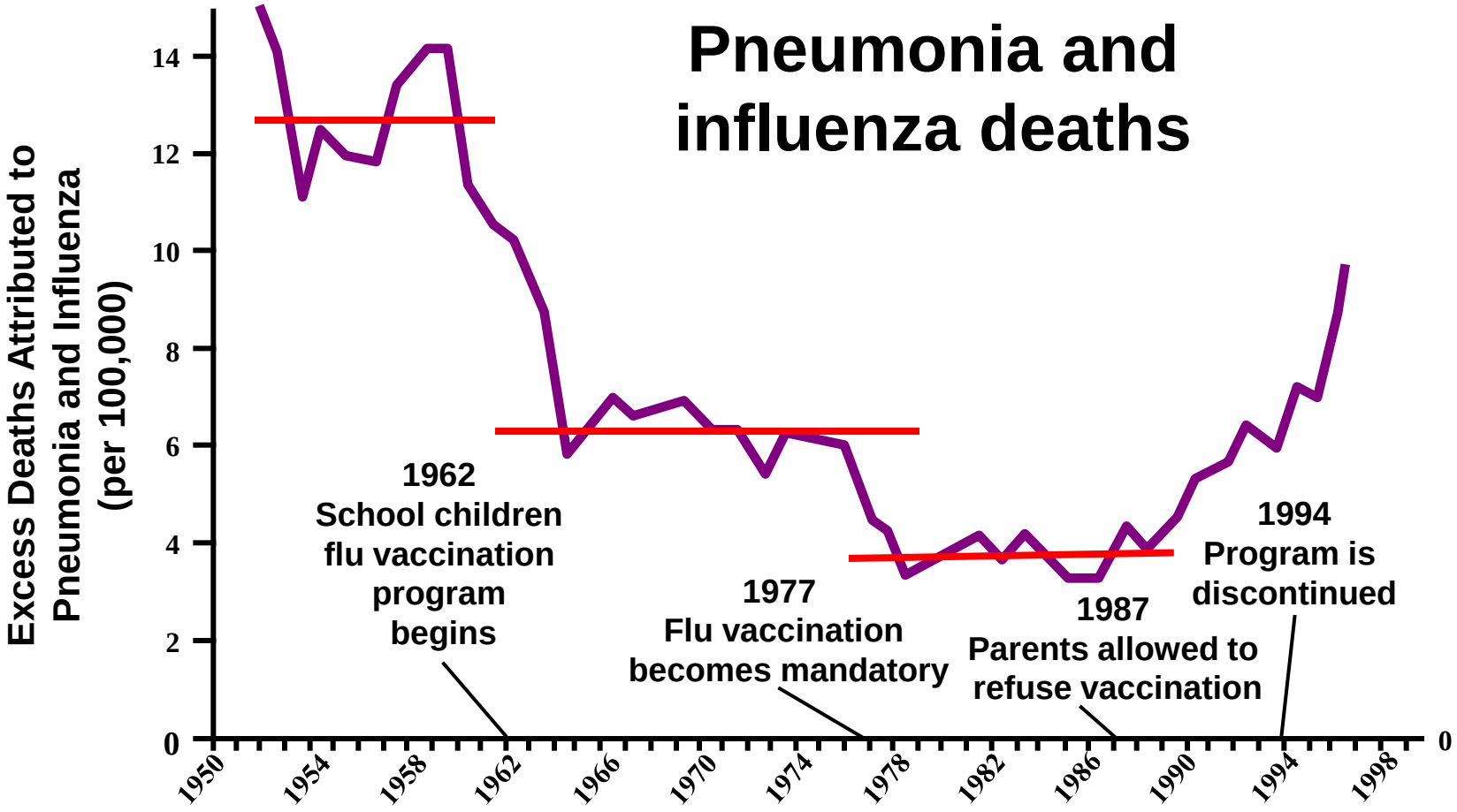

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Mathematical Modeling…

80% of school kids vaccinated → >90% decrease in flu for everyone else!

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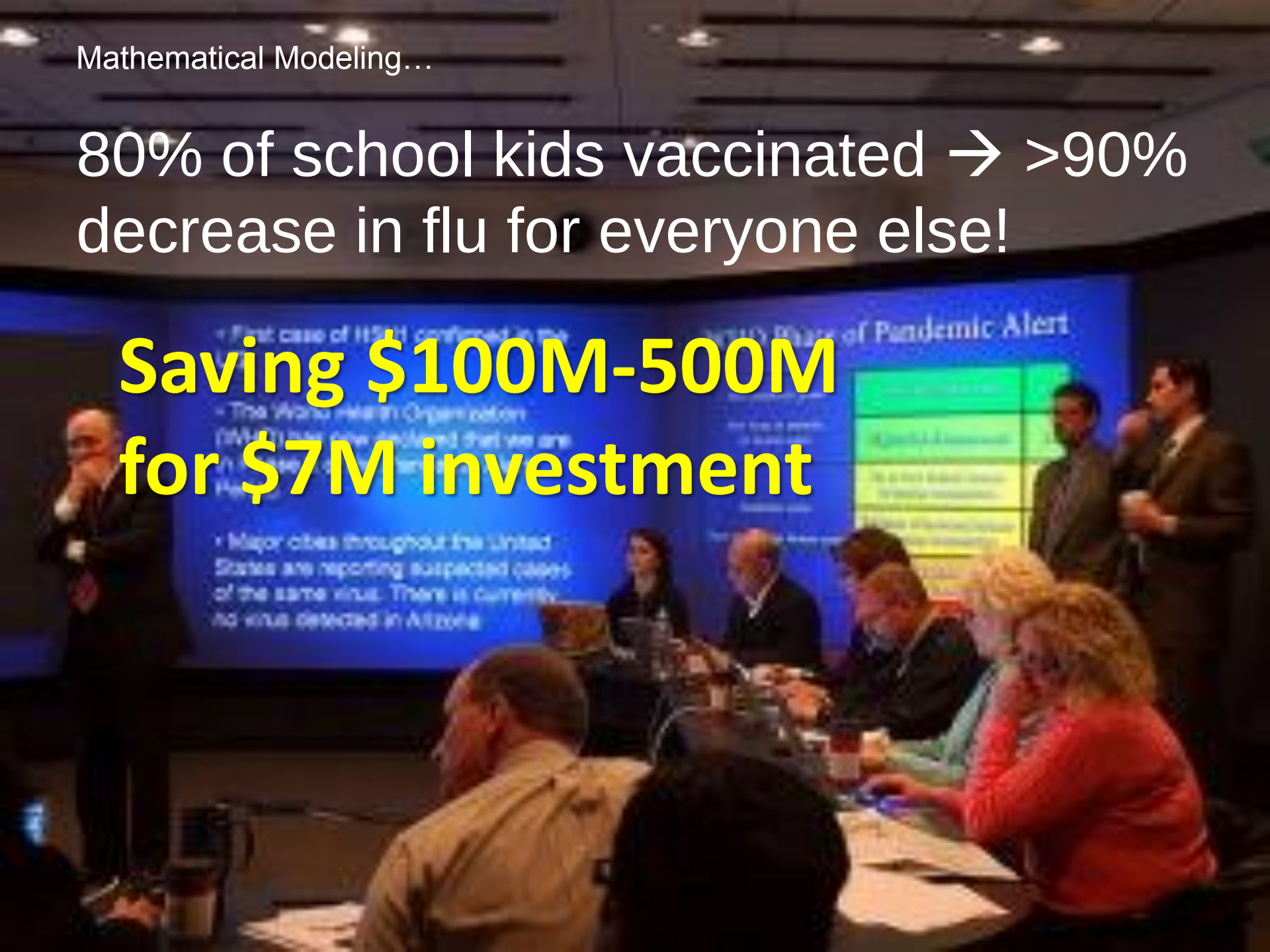


Saving $100M-500M for $7M investment

BUT
WAIT
THERE'S
MORE!

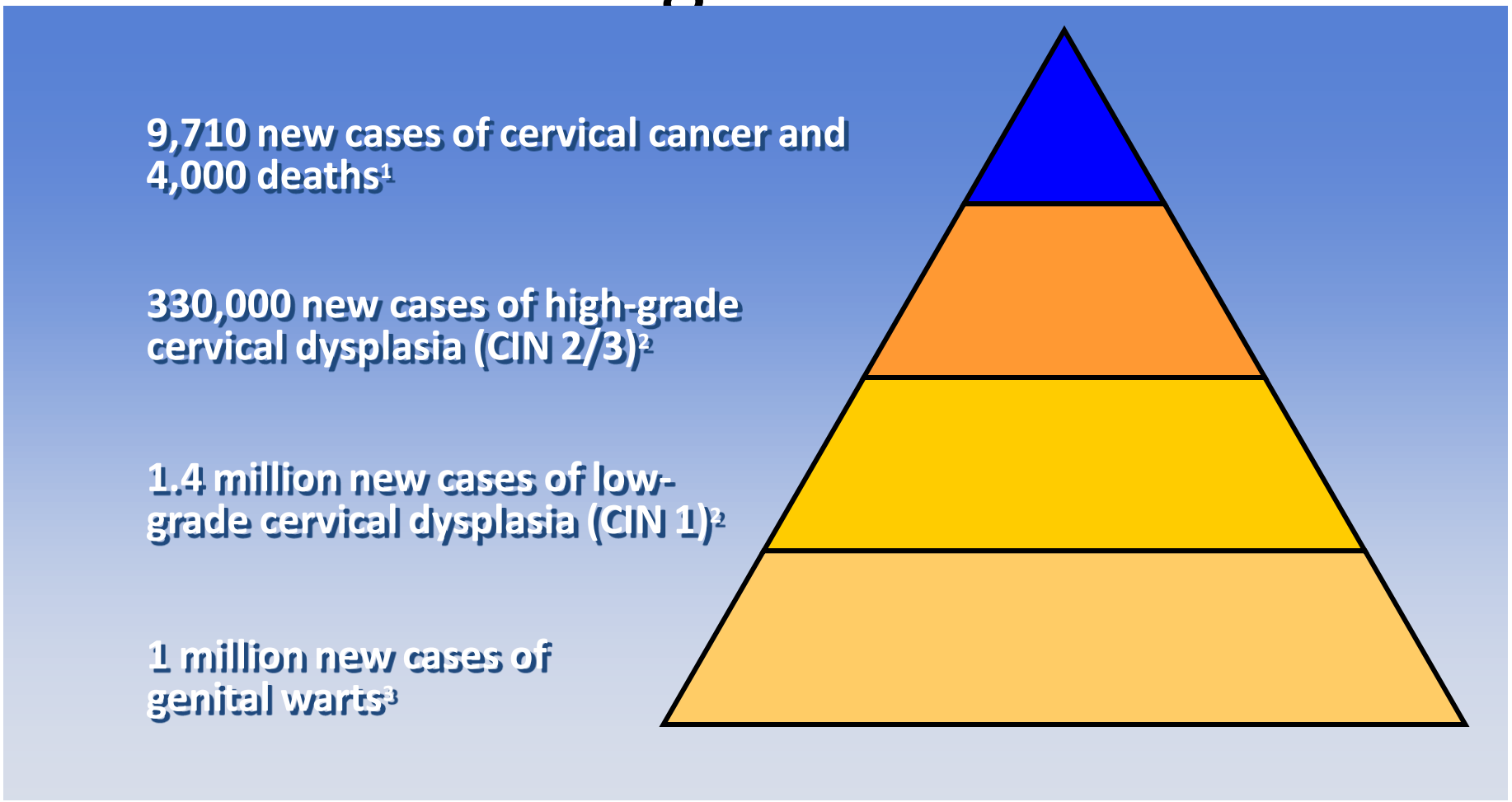
Pertussis

- 90% of deaths < 4 mo
- 72% of babies < 6 mo are hospitalized
- 1 in 10 infants develop pneumonia
- 1 in 50 infants have seizures or convulsions

Pertussis

The source for 75% of infant pertussis is a household contact

Estimated Annual Burden of HPV-Related Diagnoses in the US



1. American Cancer Society. Cancer Facts and Figures 2006. Atlanta, Ga: American Cancer Society; 2006:4. 2. Schiffman M, Solomon D. Findings to date from the ASCUS-LSIL Triage Study (ALTS). *Arch Pathol Lab Med*. 2003;127:946–949. 3. Fleischer AB, Parrish CA, Glenn R, Feldman SR. Condylomata acuminata (genital warts):
Patient demographics and treating physicians. *Sex Transm Dis*. 2001;28:643–647.

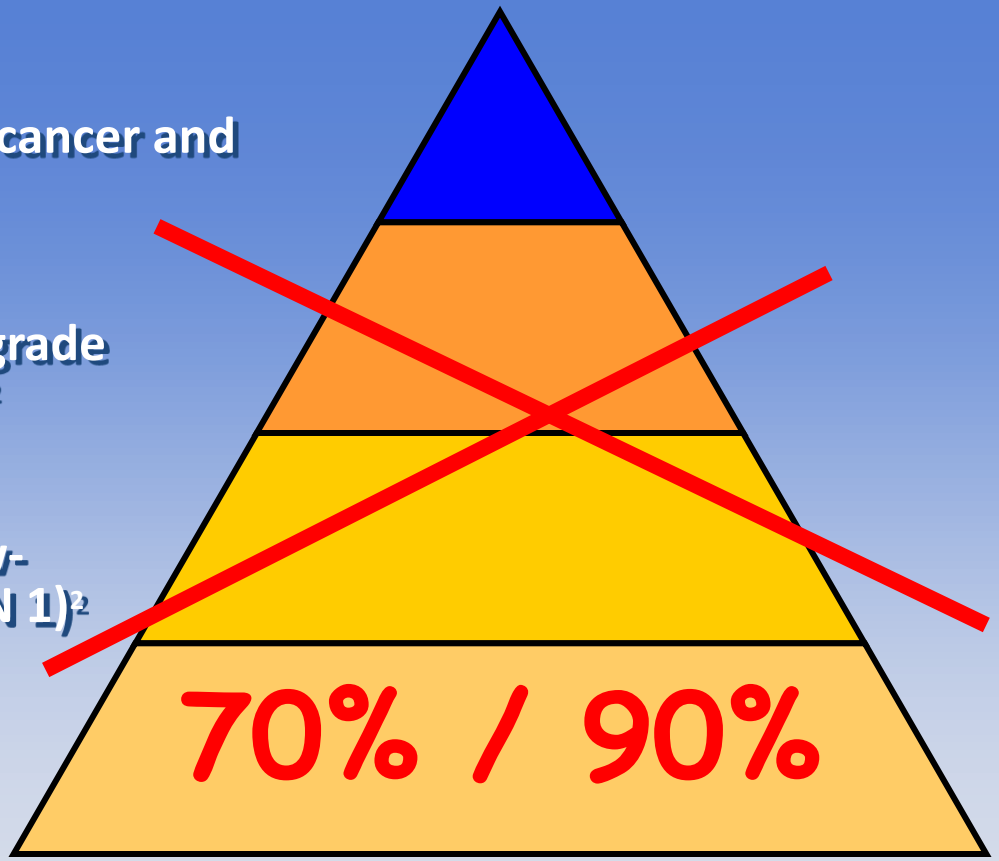
Estimated Annual Burden of HPV-Related Diagnoses in the US

9,710 new cases of cervical cancer and 4,000 deaths[1]

330,000 new cases of high-grade cervical dysplasia (CIN 2/3)[2]

1.4 million new cases of low-grade cervical dysplasia (CIN 1)[2]

1 million new cases of genital warts[3]



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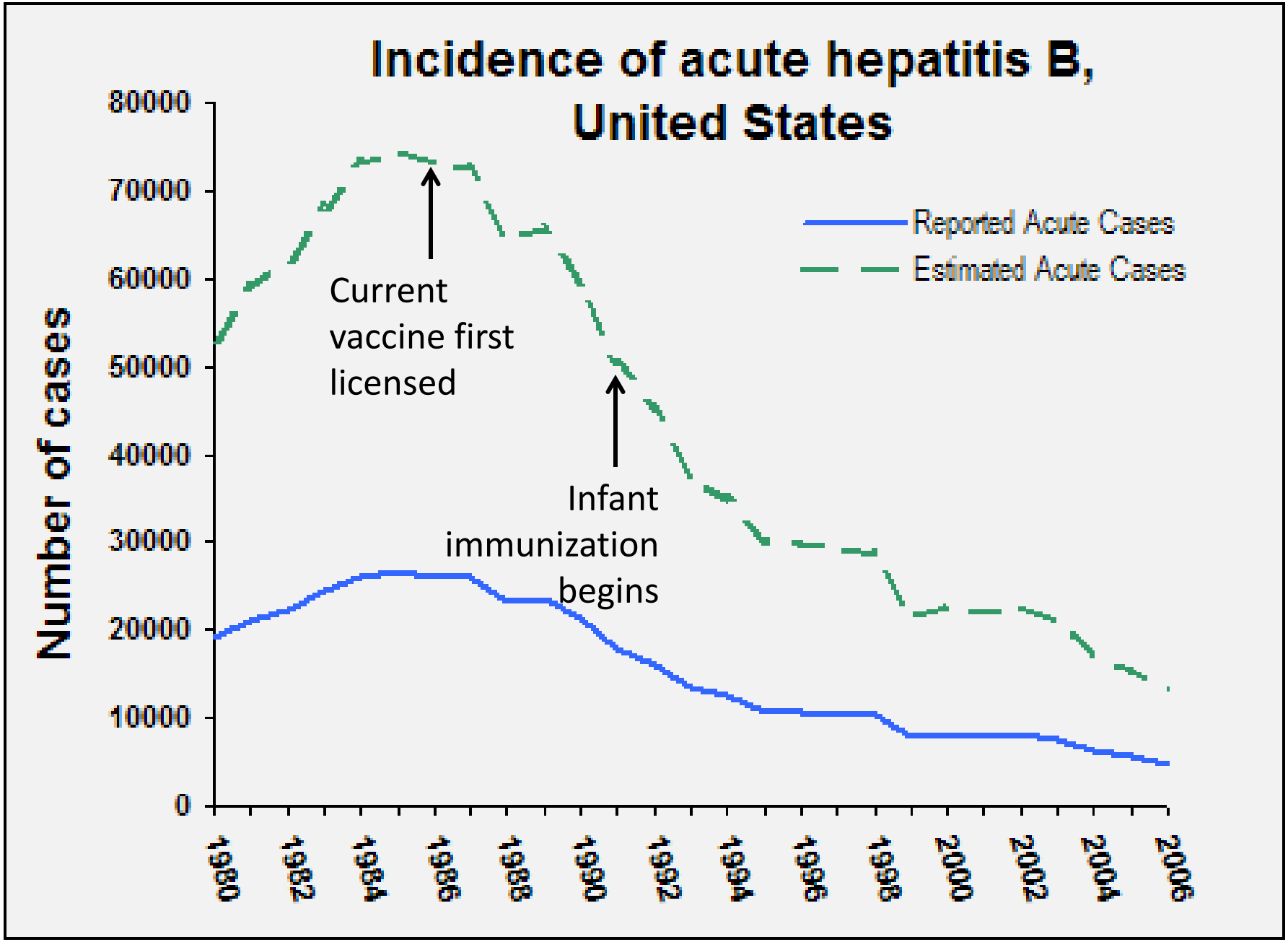
Instead

ARS 36-672

Immunizations; department rules

A. Consistent with section 15-873, the director shall adopt rules prescribing required immunizations for school....

C. Immunization against the human papillomavirus is not required for school attendance.


Incidence of acute hepatitis B, United States
Number of cases
80000
70000
60000
50000
40000
30000
20000
10000
0
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
Reported Acute Cases
Estimated Acute Cases
Current vaccine first licensed
Infant immunization begins

What are our real risks?

Mental Retardation?

Risk Perception

THE ROANOKE TIMES
Monday, September 20, 2004

failblog.org

STEPHANIE KLEIN-DAVIS | The Roanoke Times

Mellisa Williamson, 35, a Bullitt Avenue resident, worries about the effect on her unborn child from the sound of jackhammers.

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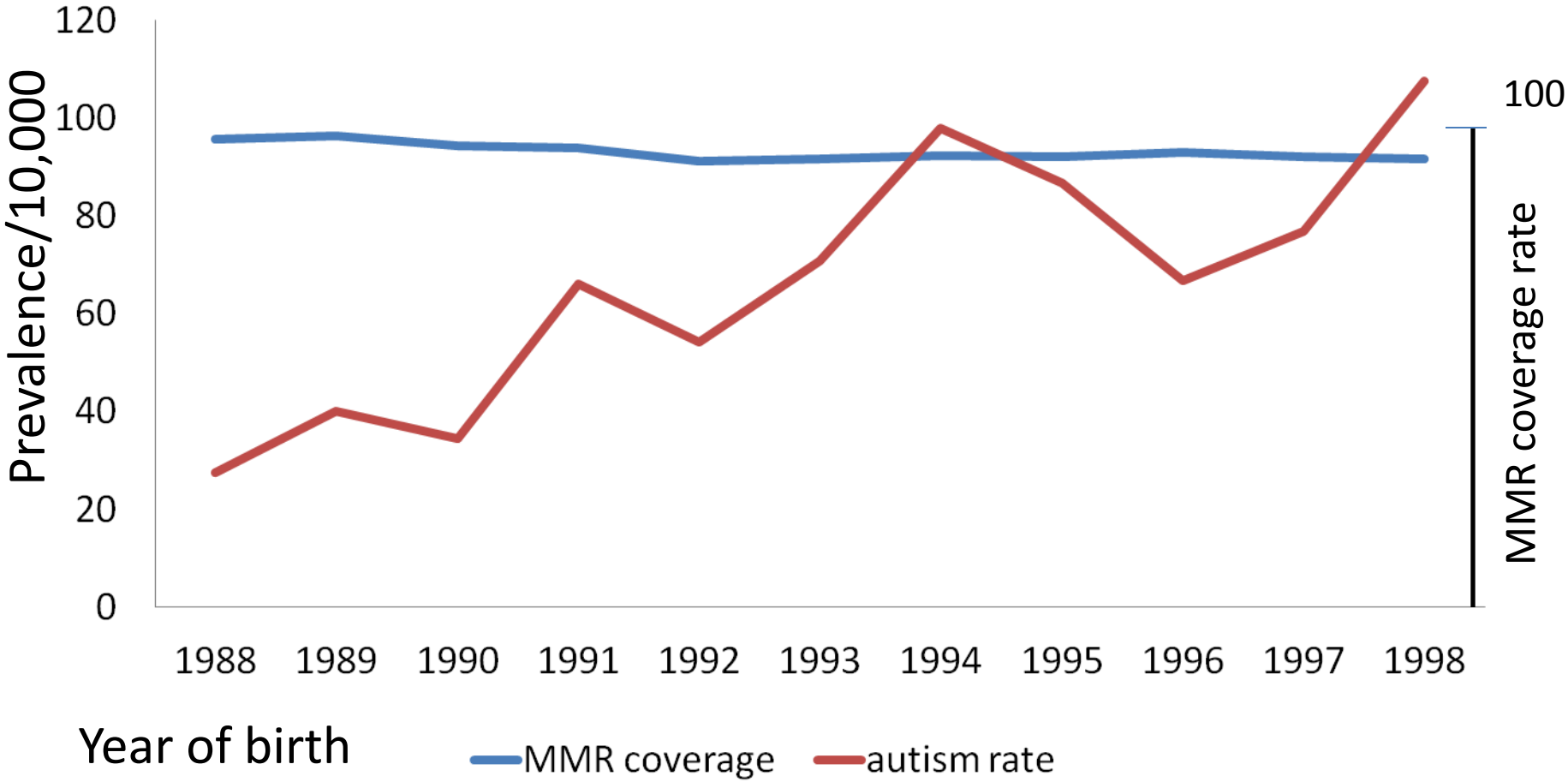
MMR and Autism Rates in Canada



Fombonne E. *Pediatrics 2006;118;e139-e150*

Perception

TOO MANY
TOO SOON
Vaccine Ingredients:
mercury, aluminum, antifreeze, formaldehyde, aborted human fetus cells, chick embryos, monkey kidney cells, fetal bovine serum, etc.
www.safevaccines.org

Large multi-antigen studies

- DeStefano F, Price CS, Weintraub ES. Increasing exposure to antibody-stimulating proteins and polysaccharides in vaccines is not associated with risk of autism. J Pediatr. 2013 Mar 29.
- Smith MJ, Woods CR. On-time vaccine receipt in the first year does not adversely affect neuropsychological outcomes. Pediatrics. 2010;125:1134-1141.

Think about it…

- Total antigens in *all* vaccines = 165
- Total antigens in one bacterium > 2,000
- We make *grams* of immunoglobulin daily
- Newborns are exposed to more new antigens on their *birthday* than from a lifetime of vaccines

How do Parents Respond?

- 13% follow “alternative” schedule
  - Mostly refusing certain vaccines or delaying some
- Of those who follow recommended schedule, 28% believe delaying would be better
- 25% believe that some vaccines cause autism in healthy children

Dempsey, AF, et al. Alternative vaccination schedule preferences among parents of young children. Pediatrics 2011;128(5):848-56.

Freed, GL. Pediatrics 2010;125;654-659.

We have met the enemy…

We broke an already complex system of vaccine delivery:

- Elimination of $10M in annual State funding for immunizations.
- CDC prohibition against deputization of private providers for VFC vaccine use in underinsured children, resulting in these kids being sent away from their medical home for vaccines.
- The use of 317 funds to continue to allow private providers to vaccinate underinsured children thwarted by the reduction of 317 funds by more than 50%.

We broke an already complex system of vaccine delivery:

- A system of private insurance that routinely reimburses private providers at less than the cost of vaccination.
- Increased complexity for private providers to participate in VFC (e.g., increased record keeping and equipment requirements).
- The above resulting in increased rates of providers referring even fully insured patients to public clinics (already at 50% of providers polled).

We broke an already complex system of vaccine delivery:

- Prohibition against the use of 317 funds for privately insured children in public clinics.
- Despite several years of working to contract with insurers, only a limited number willing to contract with and/or reimburse public health depts, and at rates that are totally of the insurers' choosing.
- Actual reimbursements are far below contracted rates, citing deductibles and Self Insured Plans that specify rates that are lower (applies to private providers and public health alike).
- The above resulting in costs to local governments that many elected officials are unwilling to bear.

We broke an already complex system of vaccine delivery:

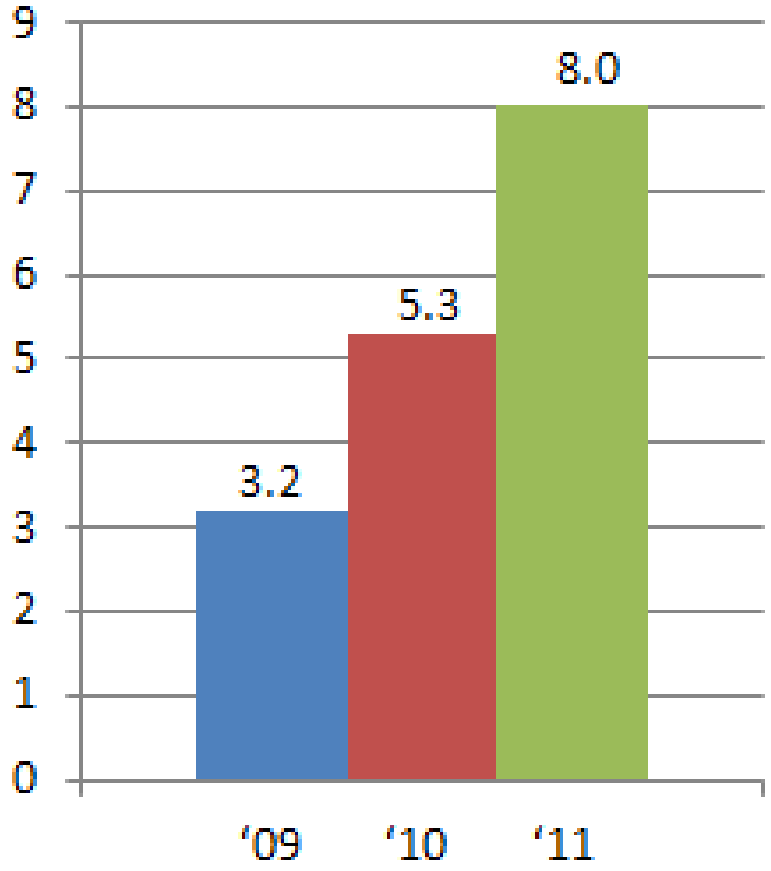
- Parents in deductibles forced to choose between paying for expensive vaccines or forgoing them.
- All of the above leading to patients referred back and forth between private and public clinics, turned away or faced with significant obstacles to receiving vaccine, which will lead to decreased immunization rates, loss of herd immunity, and the threat of outbreaks.
- A misperception that the ACA will fix all of this, even though "first dollar coverage" does not affect the actual reimbursement *rate* (often less than the cost); and >65% of currently covered patients in Arizona are in grandfathered plans.

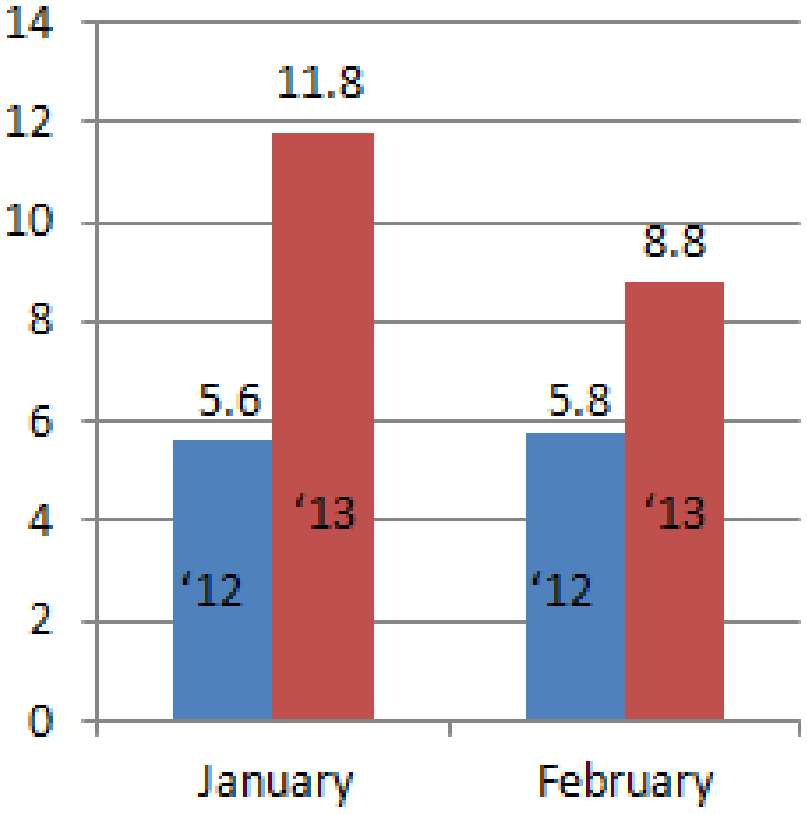
Rising Cost of Vaccinating

44% of private practice overhead in vaccine stock

Offices need 120% of retail cost to cover expenses

Percent of Insured Children at MCDPH Immunization Clinics





Public/Private Business Model

- Oct - Jan Maricopa administered vaccine to privately insured kids at a cost of:

  $202,849.43

- To date payments from private health plans:

  $102,457.66

It can take months to recoup investment from health plans

Payment must cover: vaccine, storage, handling, insurance and billing

Public/Private Business Model

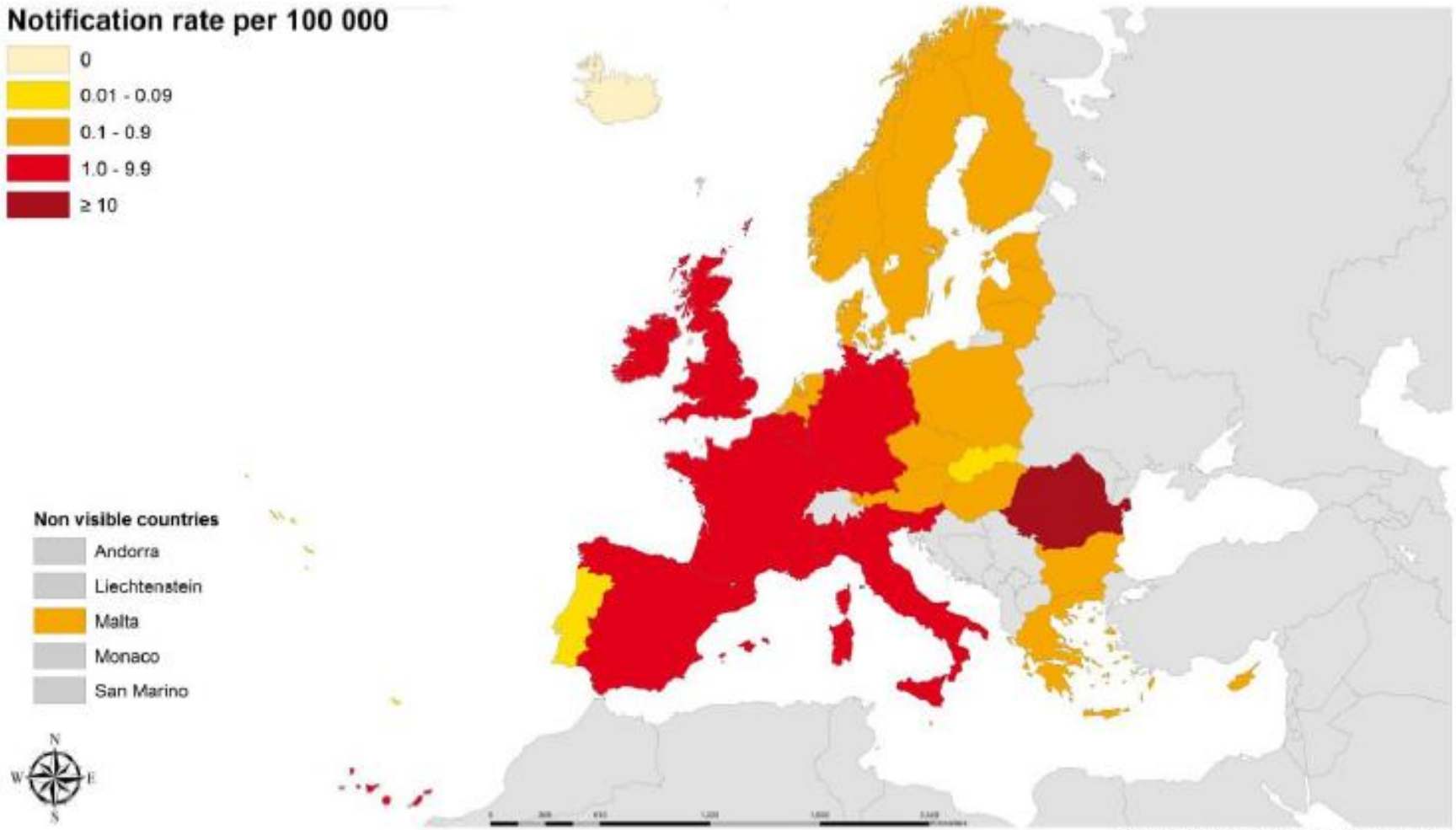
- Health Plan C loaded public health in their system incorrectly, so are denying payments.
  - 24 emails and calls have been made in 45 days to have plan to correct – still nothing
- Health Plan D took 18 months to correctly load health department into system
- Health plan E refused to contract with public health paid $2,800 on $35,000 vaccine bill

Maintaining the Public Health *System*

- We *all* depend on this system
  - It matters to you whether your neighbor is vaccinated
  - Vaccines are a social good that we've treated as just another individual health care commodity
- Reimbursing local health depts is NOT a fix
- Private providers *must* stay in system

What if we screw up?

Figure 5. Measles notification rates (cases per 100 000 population) by country (May 2011–April 2012; n=17 488)



Source: TESSy. Date of data retrieval 28/05/2012.

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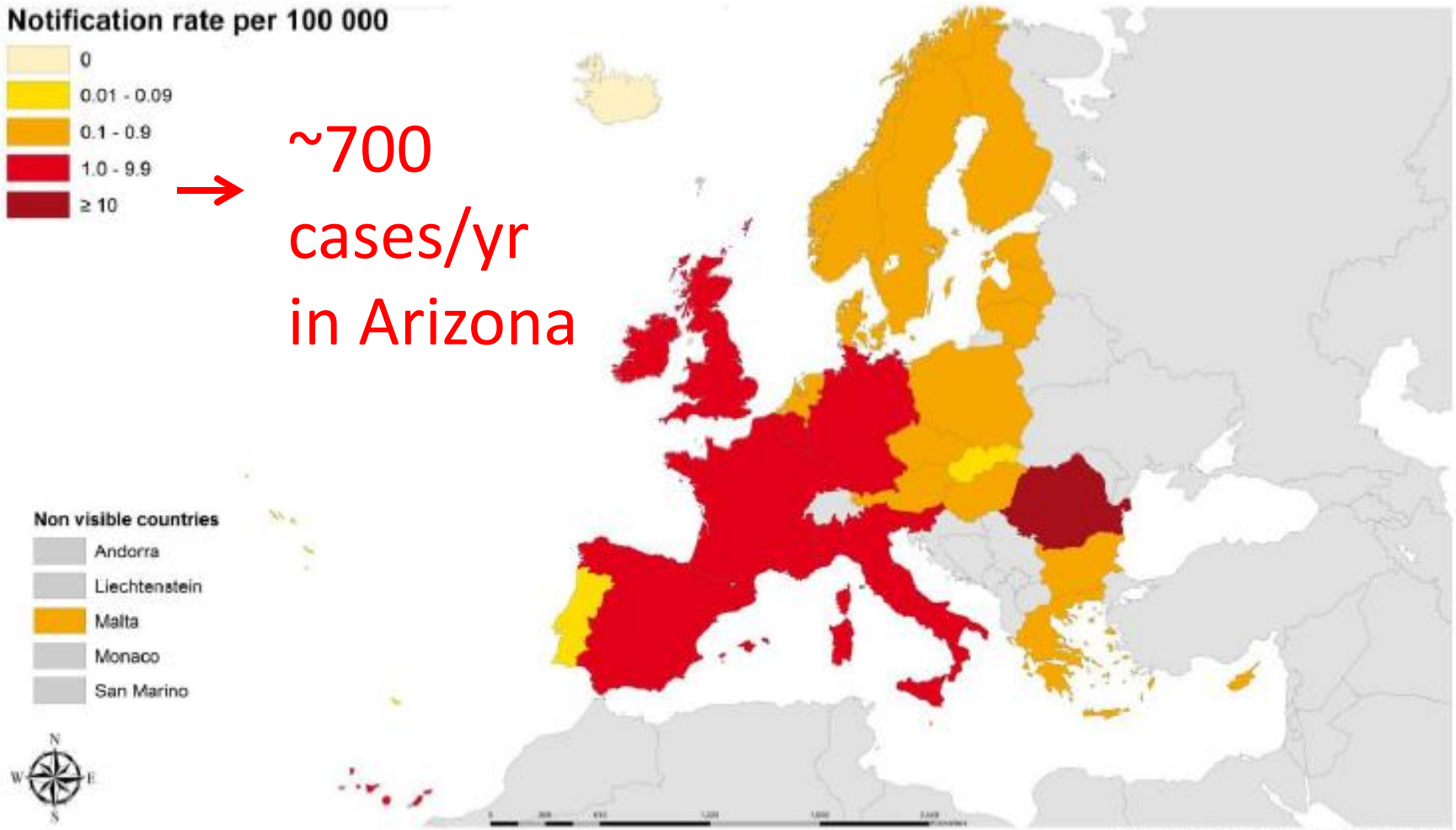
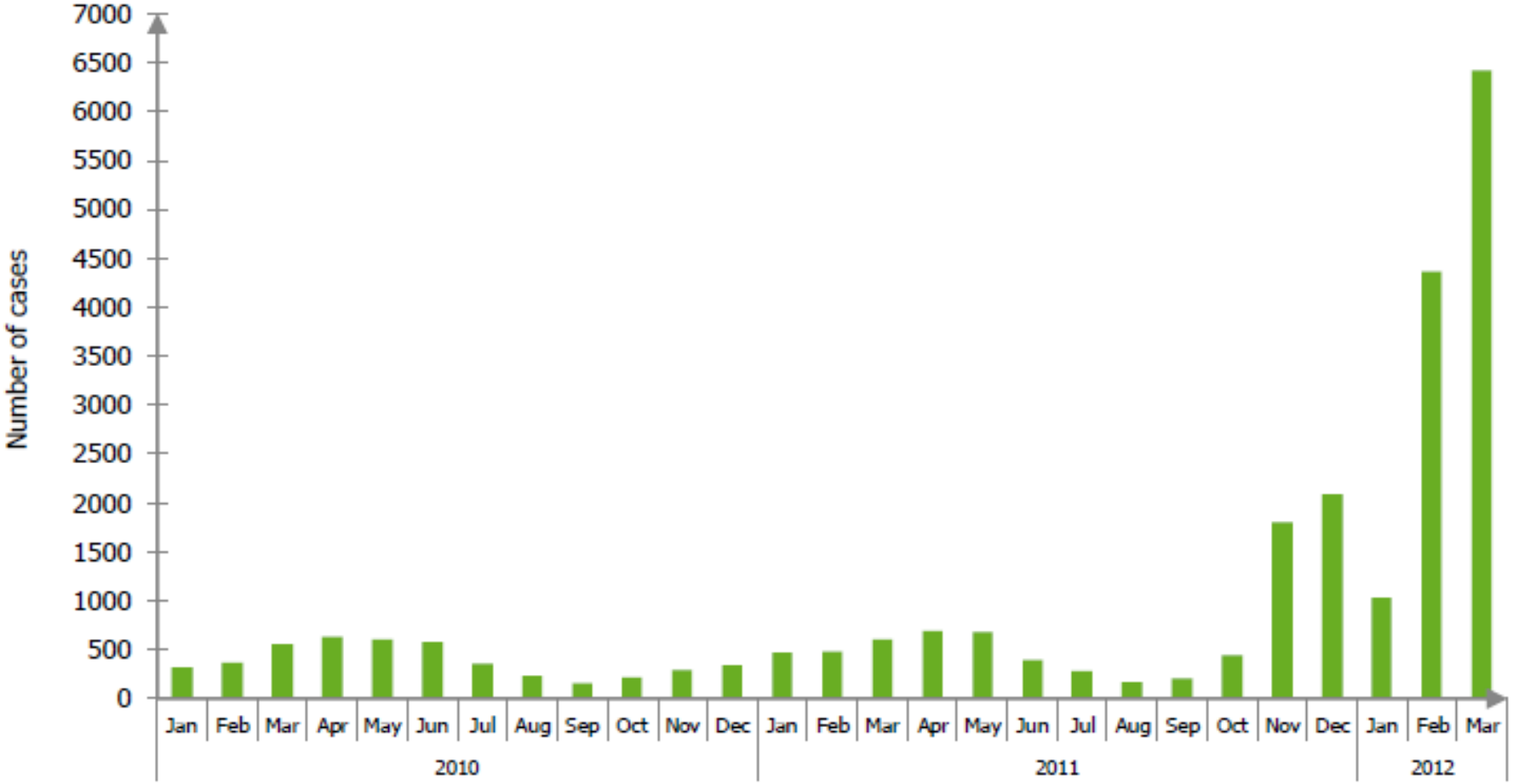


~700 cases/yr in Arizona

Source: TESSy. Date of data retrieval 28/05/2012.

SPL

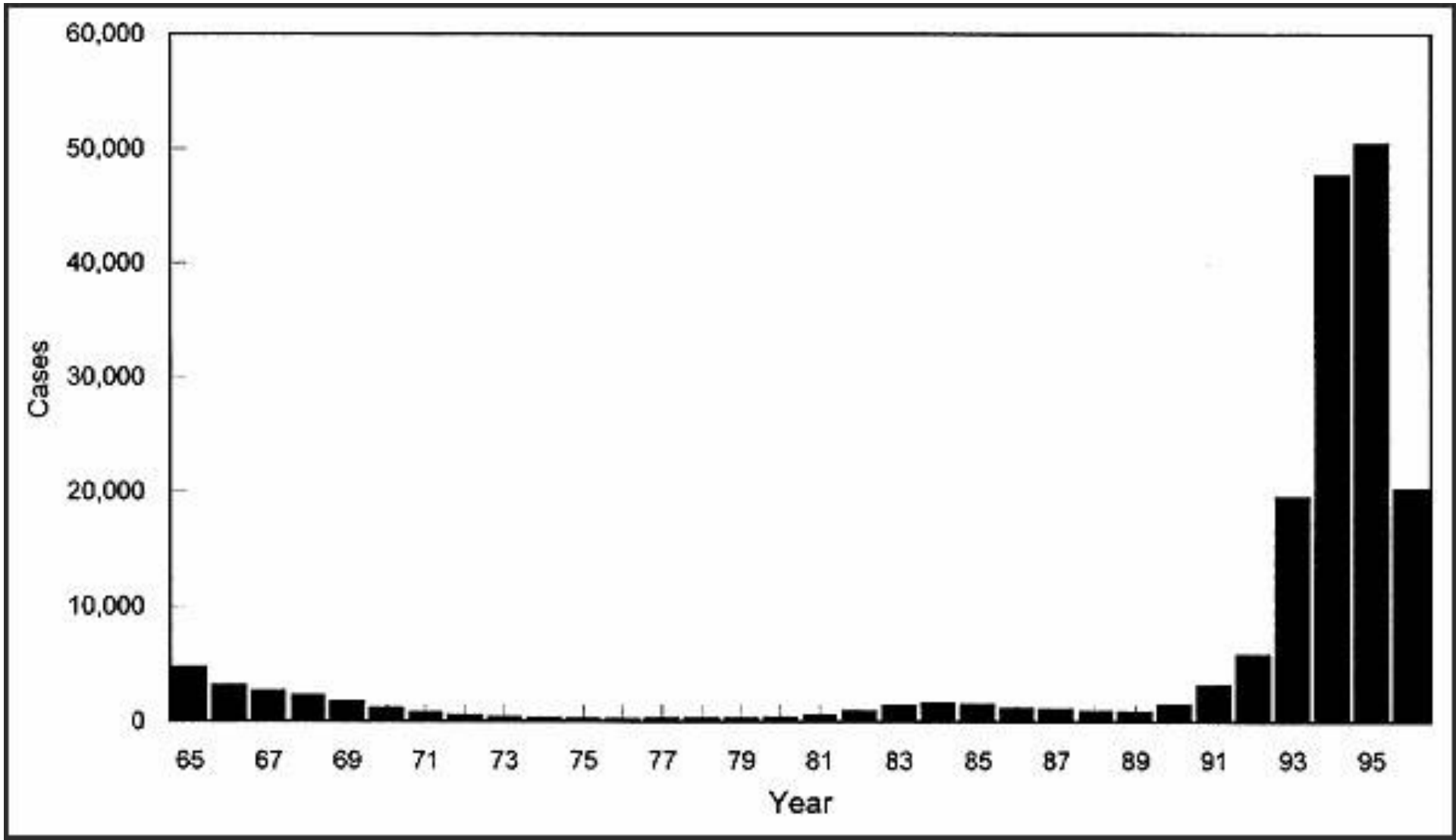
Figure 9. Distribution of rubella cases, January 2010 to March 2012, by month, EU/EEA reporting Member States (n=24 774)



Source: TESSy

Really?

Diphtheria in former Soviet Rep.



WHY SHOULD I BOTHER? 'LOOKS TO ME LIKE THE WATER'S DEEPER IN YOUR END!

Maricopa County
Department of Public Health

WeArePublicHealth.org twitter.com/Maricopahealth facebook.com/MCDPH