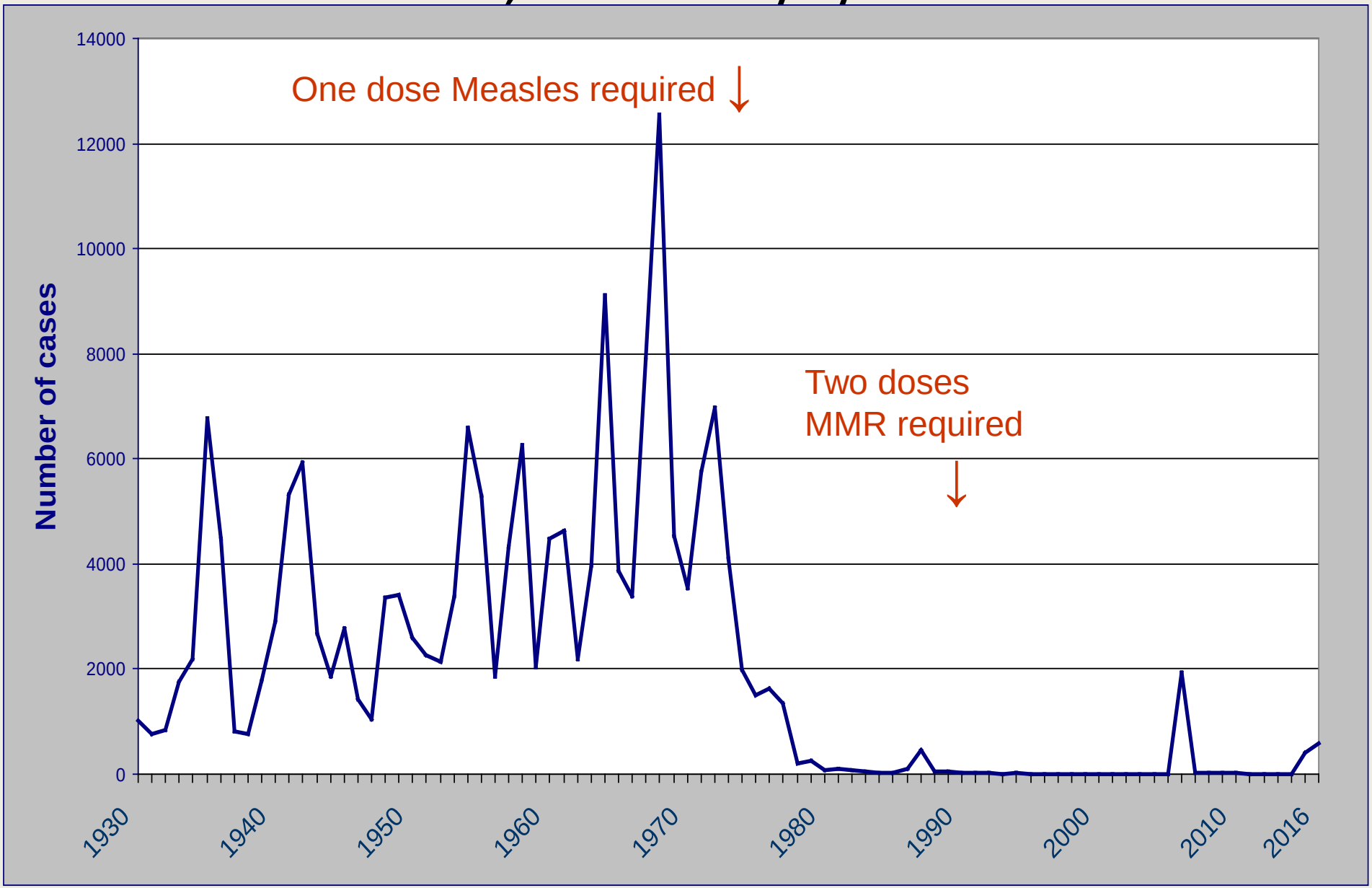
Is a Third Dose Needed for Outbreak Control? Mumps Lessons from Iowa

Johnson County Health Department
University of Iowa (Student Health Services)
Centers for Disease Control and Prevention
Iowa Department of Public Health

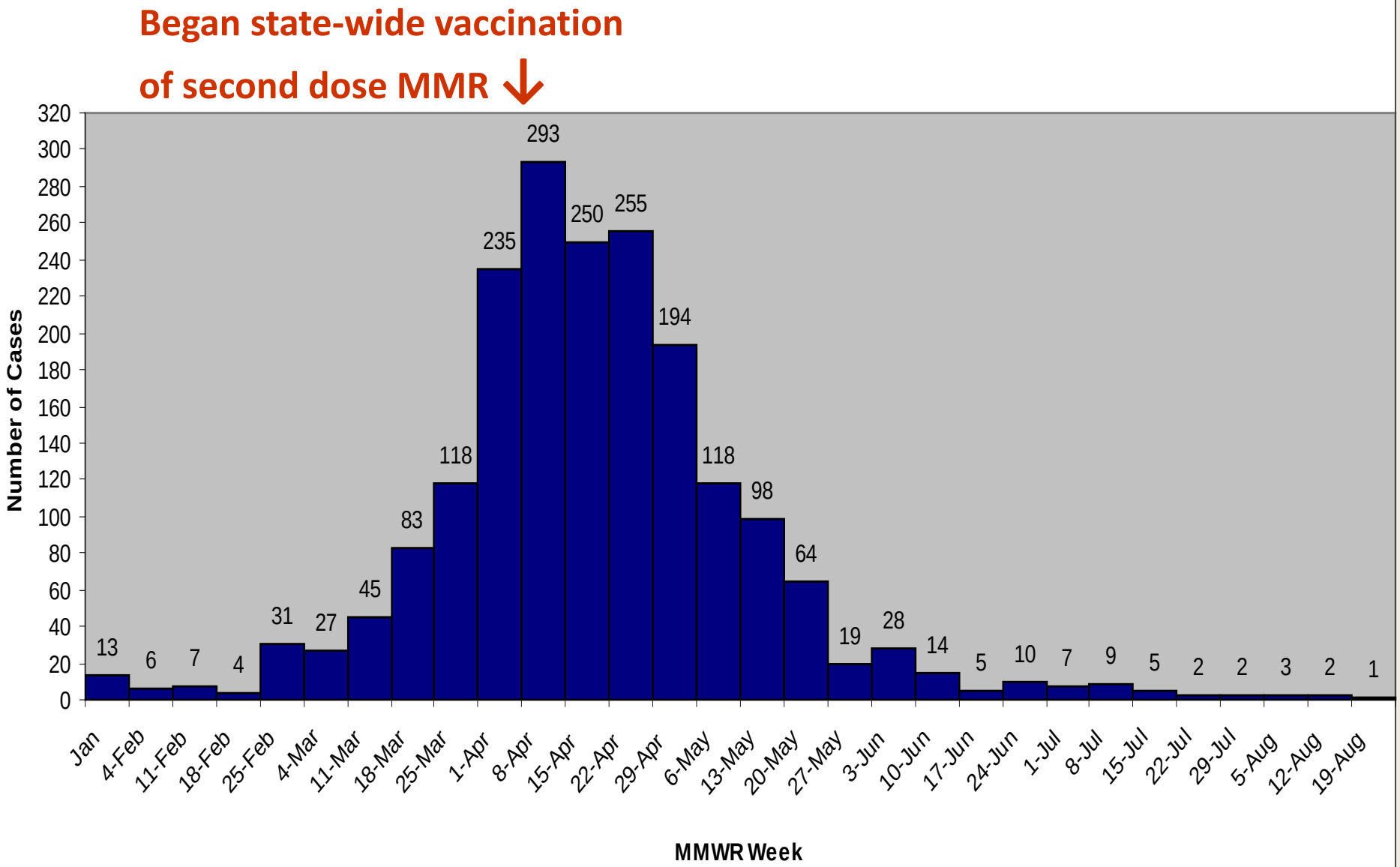
National Immunization Conference, September, 2016

Number of Cases of Mumps, Iowa, 1930 – 9/6/2016

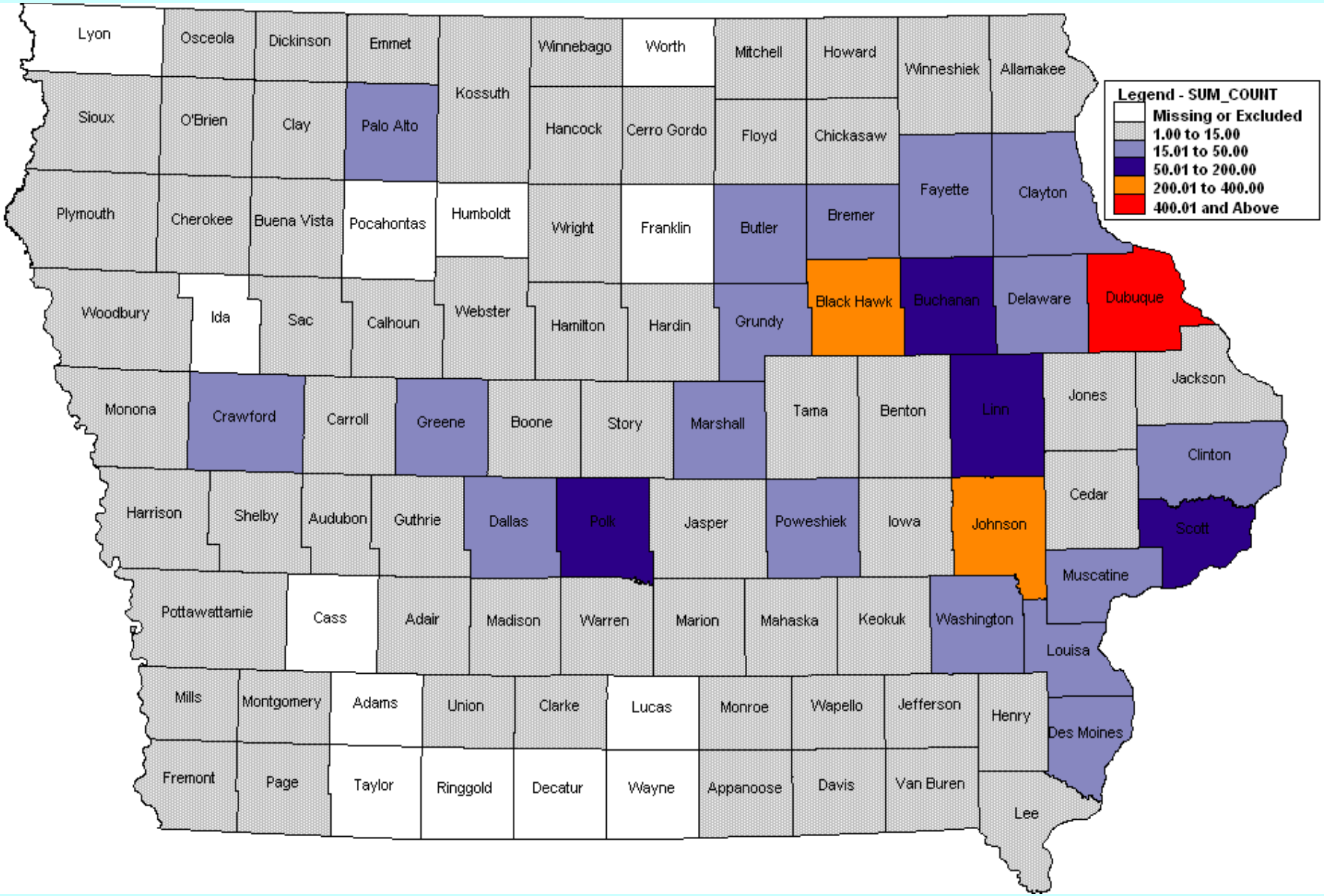


Number* of cases of mumps, by date of onset- Iowa, through August 22, 2006

*N=1948



Mumps Cases by End of Outbreak, 2006, Iowa



Economic Surveillance: Total Estimated Costs (Iowa Only)

- Overall hours in the response:
  - 26,404 person-hours
    - Implement 2cd dose vaccination clinics (42%),
    - Logistics (16%)
    - Consultations - healthcare providers/public (15%).
- Response-associated costs
  - $673,000 for personnel
  - $381,000 for materials and supplies.

- Total costs were

> ONE MILLION DOLLARS

University of Iowa Snapshot

- **U Iowa enrollment: >30,000 (fall and spring semesters)**
- **U Iowa & U Iowa Hospitals & Clinics (UIHC): 24,000 employees**
- **Iowa City population: 70,000 residents**
- **UIHC: Iowa's largest tertiary care medical center**
- **Strict 2-dose MMR enforced 2012 (required 2003)**
  - Response to 2006 mumps outbreaks
  - Students submit proof of doses (provider signature required)
  - Medically-trained verifier reviews vaccine information and uploads to student registration database
  - **2 doses required to register for next semester's courses**
  - Frequent reminders sent to students without documentation
  - Positive titers acceptable alternative (rare)
  - Medical and religious exemptions allowed (rare)

CDC: During Outbreaks, Third Dose MMR May be Administered:

1) High 2 dose MMR coverage (>90%)

2) Intense exposure settings likely to facilitate transmission (such as schools, colleges, correctional facilities)

3) High attack rates (>5/1000 population and ongoing transmission in last 2 weeks in target population)

Timeline of Outbreak at U Iowa

First case occurred on July 15, 2015

By end of July 2015, 13 Cases had occurred

Discussions began – local/state PH and U Iowa

By Start of Fall Semester (August 24), 55 cases occurred

By late October, ~ 120 cases in county, ~90 on campus

94% of ill students are <23 years old (22,000 students <23)

Several clusters, cases increasing, spreading from campus

Campus breaks coming up = more spread outside campus?

Mass Vaccination Clinics = November 10, 11, 13, 16, 17, 19

Winter Breaks:

- Thanksgiving November 26-29, and
- December 18, 2015 – January 17, 2016

MUMPS VACCINES

FREE AT THE IMU

Tuesday, Nov. 10
Main Lounge • 10AM - 7PM

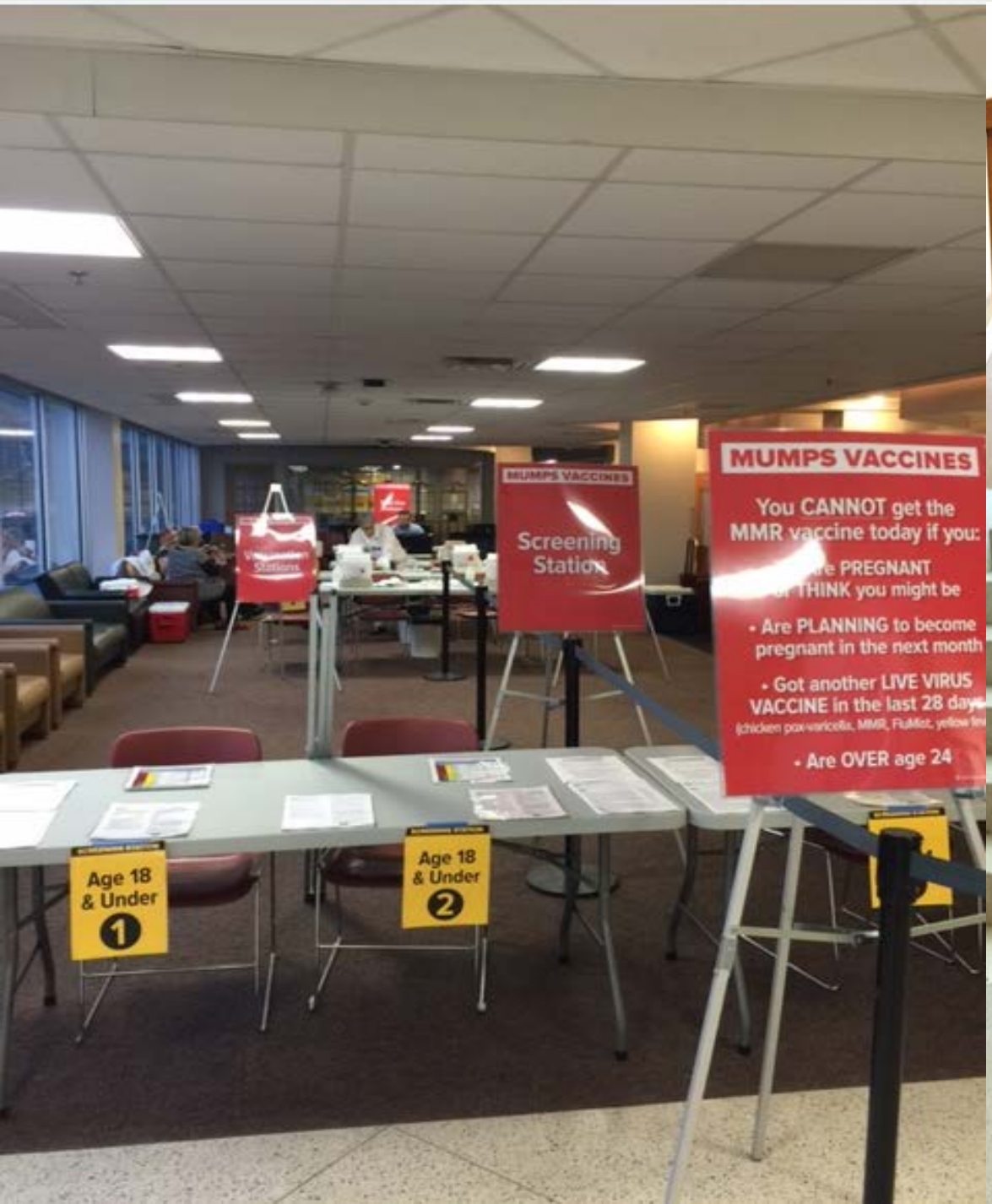
Wednesday, Nov. 11
2nd Floor Ballroom • 10AM

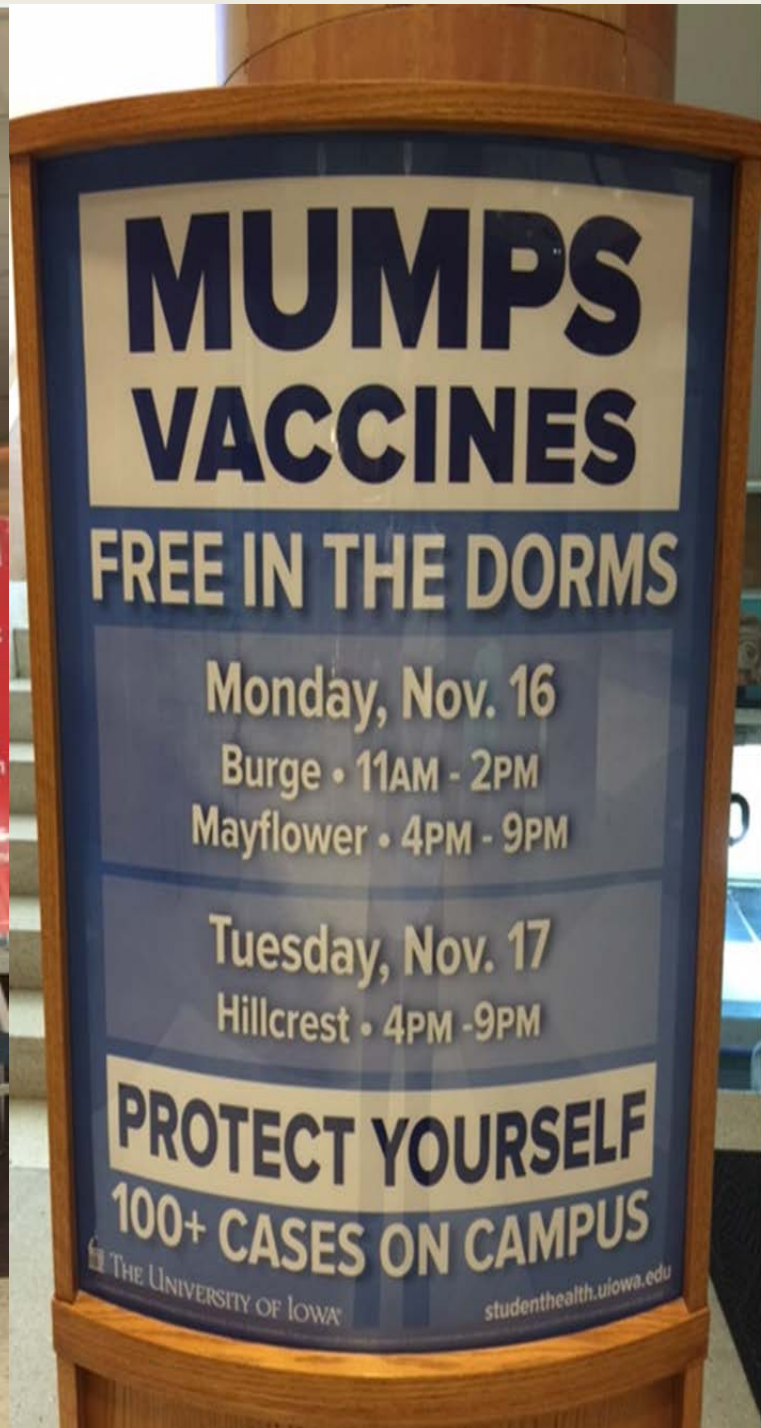
PROTECT YOURSELF

100+ CASES ON CAMPUS

THE UNIVERSITY OF IOWA

studenthealth.uiowa.edu


MUMPS VACCINES
Screening Station
MUMPS VACCINES
You CANNOT get the MMR vaccine today if you:
PREGNANT
THINK you might be
• Are PLANNING to become pregnant in the next month
• Got another LIVE VIRUS VACCINE in the last 28 days
• Are OVER age 24
Age 18 & Under 1
Age 18 & Under 2


MUMPS VACCINES
FREE IN THE DORMS
Monday, Nov. 16
Burge • 11AM - 2PM
Mayflower • 4PM - 9PM
Tuesday, Nov. 17
Hillcrest • 4PM -9PM
PROTECT YOURSELF
100+ CASES ON CAMPUS
THE UNIVERSITY OF IOWA
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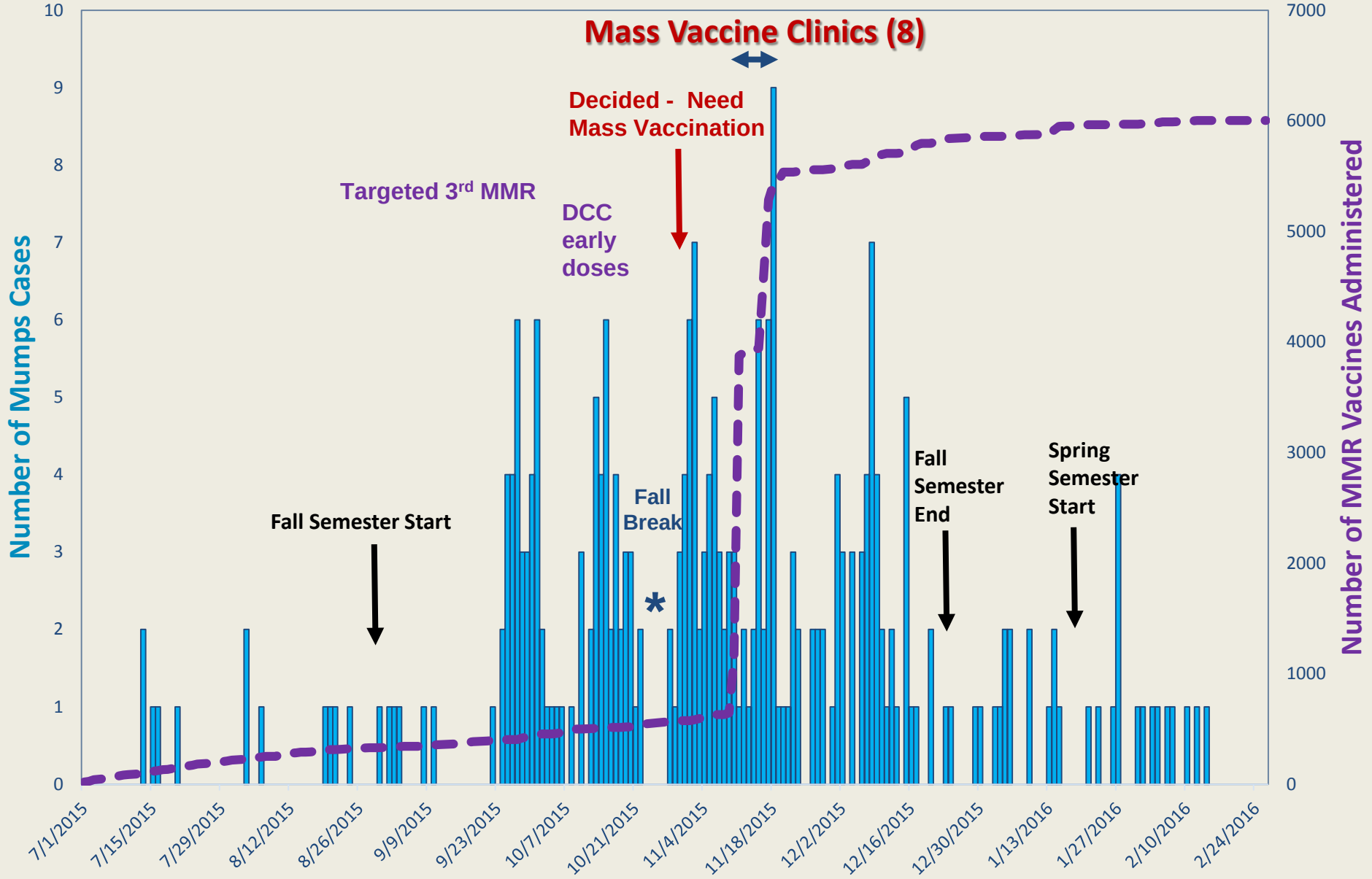
Mumps Cases and Cumulative MMR Vaccines, U Iowa Students, Fall-Spring 2015-16



Student Information Campaign Started 8/4/2015 (social media, e-mails to students and parents, student health advisories)

Lessons Learned Early in Outbreak

1) Free vaccine improved student uptake of vaccine

2) Targeted of vaccination fraternity member but only one fourth (24/120) actually received - tried to do at fraternity but they refused so had at the union but members didn't come

3) Good communications and frequent updates with medical partners in the community BUT we forgot to include dentists!

4) Good communications and frequent updates with others in community like schools, churches, parents of students

5) Need to look months ahead and start planning for all possible scenarios

6) Started giving third dose at student health clinic early in fall semester, and pushed at start of spring semester –especially for new students.

Lessons Learned for Mass Vaccine Clinic Operations

1) Order enough vaccine – 3000 doses in beginning not enough – had to cancel one clinic until another 5000 could be ordered/delivered

2) Evening hours were important

3) Centralized locations (used student union, large dormitories, large classroom buildings, sports medicine center)

4) Visual barriers between students in line and actual vaccine injection (some students got lightheaded and squeamish when they could see)

5) Used medical professional students for most volunteers (however they said they needed more training on things like what "immunocompromised" meant)

6) Place for resting after vaccination with crackers and juice (provided by hospital dietary group)

7) Break area for staff with food (pizzas provided by community)

Lessons Learned During Third Dose MMR Response

1) Clearly defined predetermined roles and responsibilities

*student health – locations, ordering vaccine and supplies

*county health dept. – vaccine management and storage (VFC and UIHC), volunteer coordination, physical set up of clinics

2) Standing orders from State Epidemiologist helped to stream line vaccinations, simplified legal issues, and allowed direct recording of vaccine dose to state immunizations registry

3) Vaccine bought by hospital purchasing system – cheaper than national vaccine contract price

4) Hospital used their Ebola preparedness training to organize supplies (needles, syringes, bandages, etc.)

Lessons Learned in Isolation of Ill Students

1) Isolation in dormitories/group living:

- took roommate out,
- could order university food on line- delivered to door
- gave masks for bathroom use

2) Isolation duration - 5 days (or until illness over which ever was longer)

3) Educational/Classroom issues –developed policies

- Educated professors to need to excuse ill students
- No written medical slip needed- student health needed to focus on outbreak control

Overall Lessons Learned

1) University ID card scanners saved time and coordination – especially after special software written allowing direct download of info into student medical record/state immunization registry

2) County used incident command early – assisted with organization and control – used as “preparedness exercise”

3) University didn’t use incident command, but later felt they should have stood it up (even though they didn’t have a specific plan for this type of situation - mainly floods, tornados) as a good practice and would have had better organization

4) One page laminated algorithm for determining vaccination qualifications/contra-indications etc.

5) Adequate volunteer medical personnel (from university medical system) on hand for questions and potential reactions

Informal Study:
(asked as students waited in line for vaccine)

What had greatest impact on your (student's) decision to get 3rd Dose of MMR vaccine?

1) **Information provided via email, social media and posters**
2) **Knew someone with mumps**
3) **My mother told me I had to get it**
4) **Concern about the complications of mumps disease (encephalitis, deafness, testicular swelling)**

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Iowa Mumps Outbreak Summary

1) Strict 2-dose requirement for students = highly vaccinated students, helped contain and ?decreased complications

2) Had reached rate about 5/1000 and spread continuing

3) Winter breaks coming up – might spread to rest of Iowa and wanted to use to help interrupt transmission – double whammy of 3rd dose and reduced exposure!

4) Over 6000 targeted students received 3rd dose *mainly because parents called student and insisted, so university's e-mails to parents very important*

5) Spread did slow and fewer students became ill (see talk **Thursday - Salon A - 11:30** for the results of the third dose of MMR in this population)