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***“Jacks’ Hack” : Respiratory Illness  
During Basic Cadet Training –  
USAFA, 2007 – 2009***

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# **Overview**

- **Characterize respiratory morbidity during Basic Cadet Training (BCT) at US Air Force Academy (USAFA)**
- **Summarize research during BCT 2009**
- **Share recent experience with nH1N1 outbreak at USAFA**
- **Highlight opportunities for further understanding of respiratory illnesses and nH1N1 via data collected during BCT 2009**



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# ***Basic Cadet Training (BCT)***

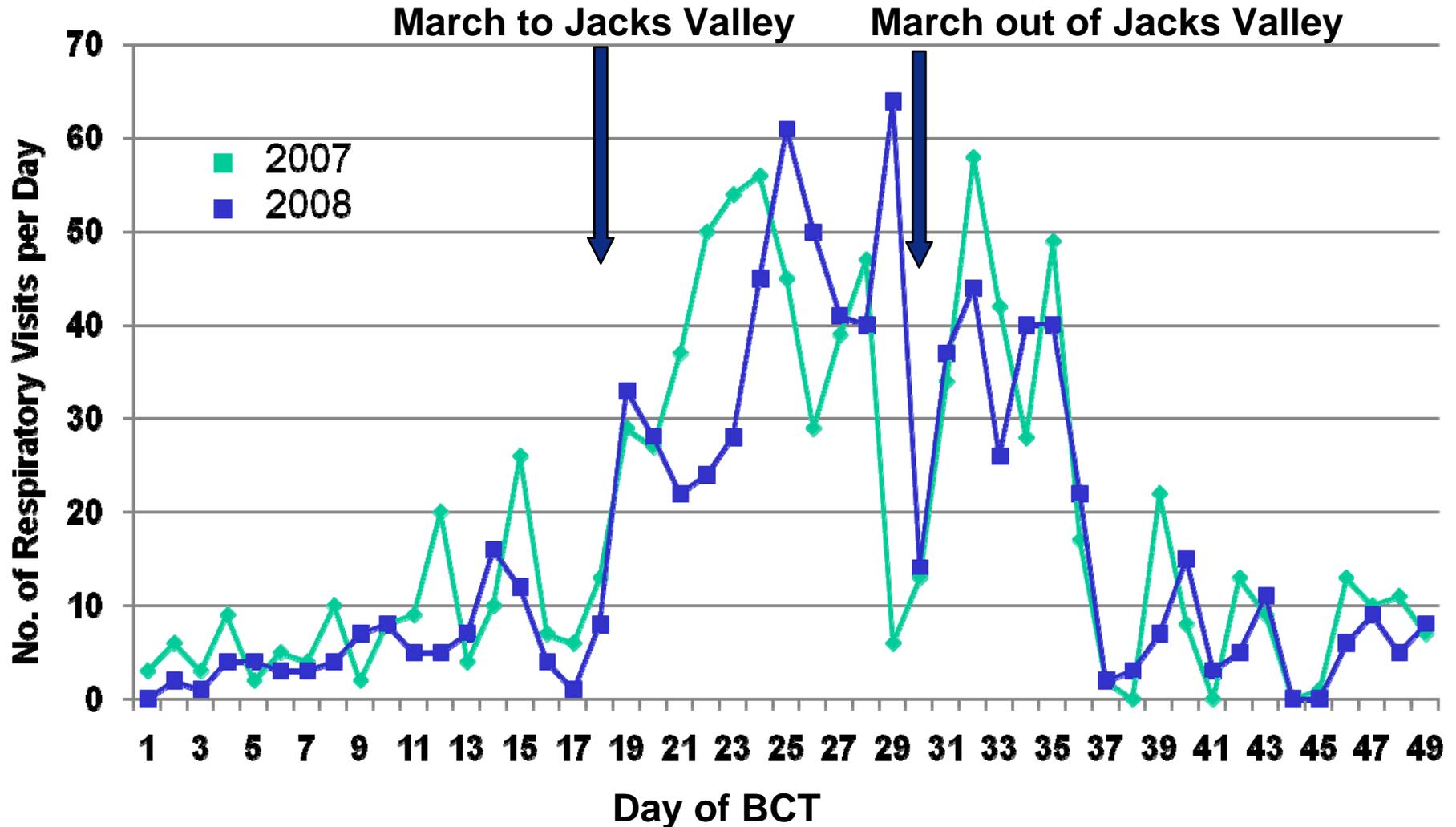
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- **Basic Training for approximately 1500 cadets**
  - **High levels of mental and physical stress**
  - **Phase 1: Academic/military training on main campus**
  - **Phase 2: Field training in Jacks Valley**
- **“Jacks’ Hack”**: Lay term for a variety of respiratory ailments that occur during field training



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# Respiratory Illnesses BCT 2007-2008



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# *Respiratory Illnesses BCT 2007-2008*

<b>Year</b>	<b>Respiratory visits in Jacks Valley</b>	<b>Respiratory visits during BCT</b>	<b>% of visits occurring in Jacks Valley</b>
<b>2007</b>	<b>426</b>	<b>807</b>	<b>53%</b>
<b>2008</b>	<b>380</b>	<b>755</b>	<b>50%</b>



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# ***“Epidemiology of Infectious Disease During BCT”***

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## **■ Objectives**

- Rule out adenovirus as cause of “Jacks’ Hack”**
- Rule out other pathogens as causative/associative**
- Evaluate possible associated risk factors**

## **■ Time period: 25 Jun - 14 Aug 2009**

## **■ Inclusion criteria**

- Cadet aged 18 and above**
- 2009 BCT participant**
- Presents for care at cadet clinic or infirmary tent**



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# ***Subjects***

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- **Group 1: Febrile Respiratory Illness (FRI Group)**
  - **Cough / sore throat**
  - **Oral temperature of 100.5 F or greater**
  
- **Group 2: Afebrile Respiratory Illness Group**
  - **Cough / sore throat**
  - **Oral temperature of less than 100.5 F**
  
- **Group 3: Control Group**
  - **Any other complaint (e.g. musculoskeletal, skin)**



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# ***Methods***

- **Questionnaire completed**
- **Clinical exam documented**
- **Throat swab and nasal wash obtained**
- **Specimens shipped to Advanced Diagnostic Laboratory (ADL) at Lackland AFB, TX**



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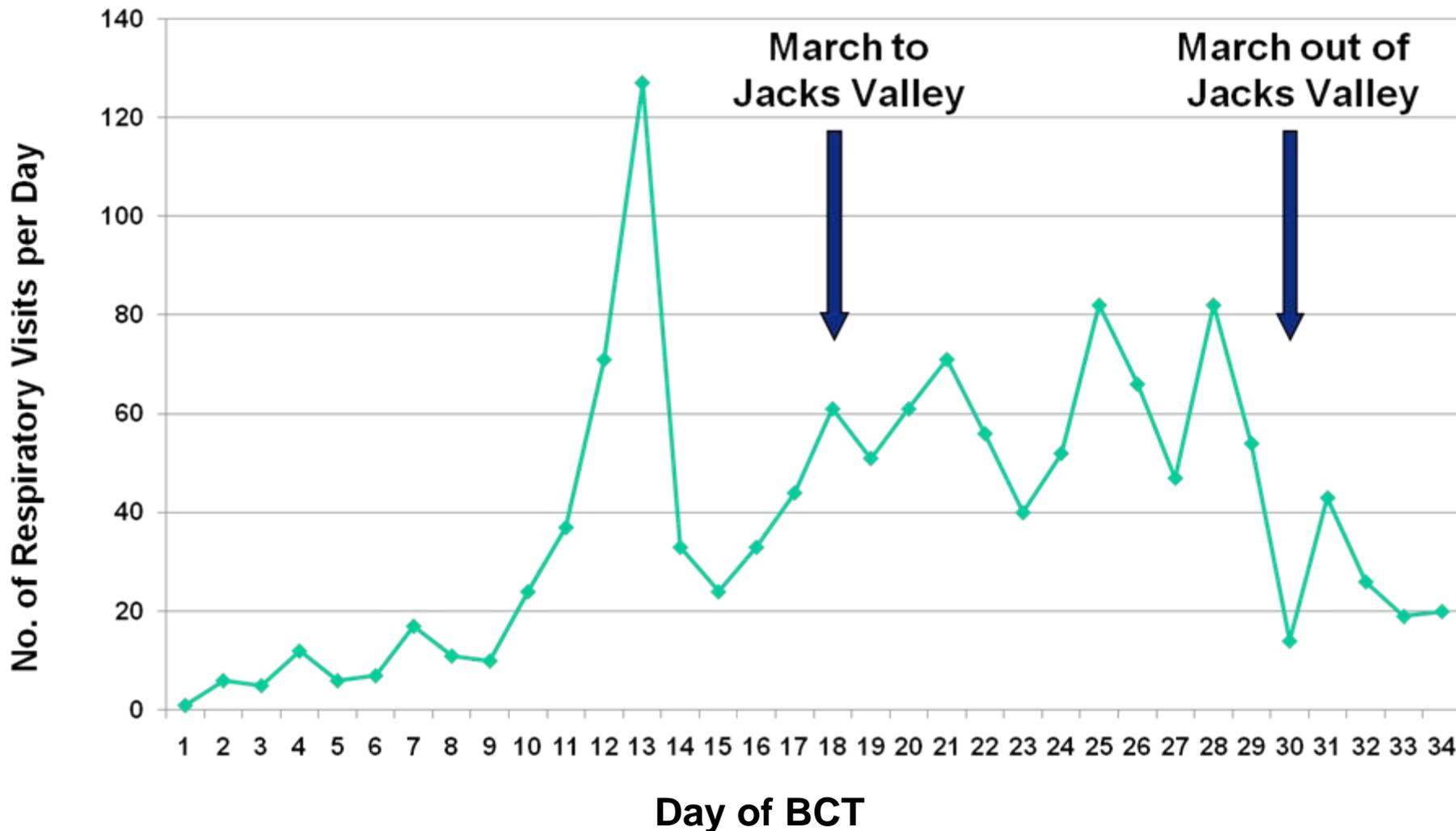
# ***Pathogens Tested***

- **Adenovirus**
  - **Universal and 3, 4, 7, 14, 21**
- **Influenza A (subtyped) & B**
- **Parainfluenza types 1, 2, 3**
- **Rhinovirus**
- **Coronavirus**
  - **HCoV229E and HCoVOC43**
- **Respiratory syncytial virus**
- **Human metapneumovirus**
- **Epstein Barr Virus**
- **Bocavirus**
- **Strep pneumonia**
- **Strep pyogenes**
- **Mycoplasma pneumonia**
- **Chlamydia pneumonia**
- **Bordetella pertussis I**
- **Bordetella pertussis II**
- **Legionella pneumophila**
- **Haemophilus influenza**
- **Neisseria meningitides**



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# Respiratory Illnesses BCT 2009

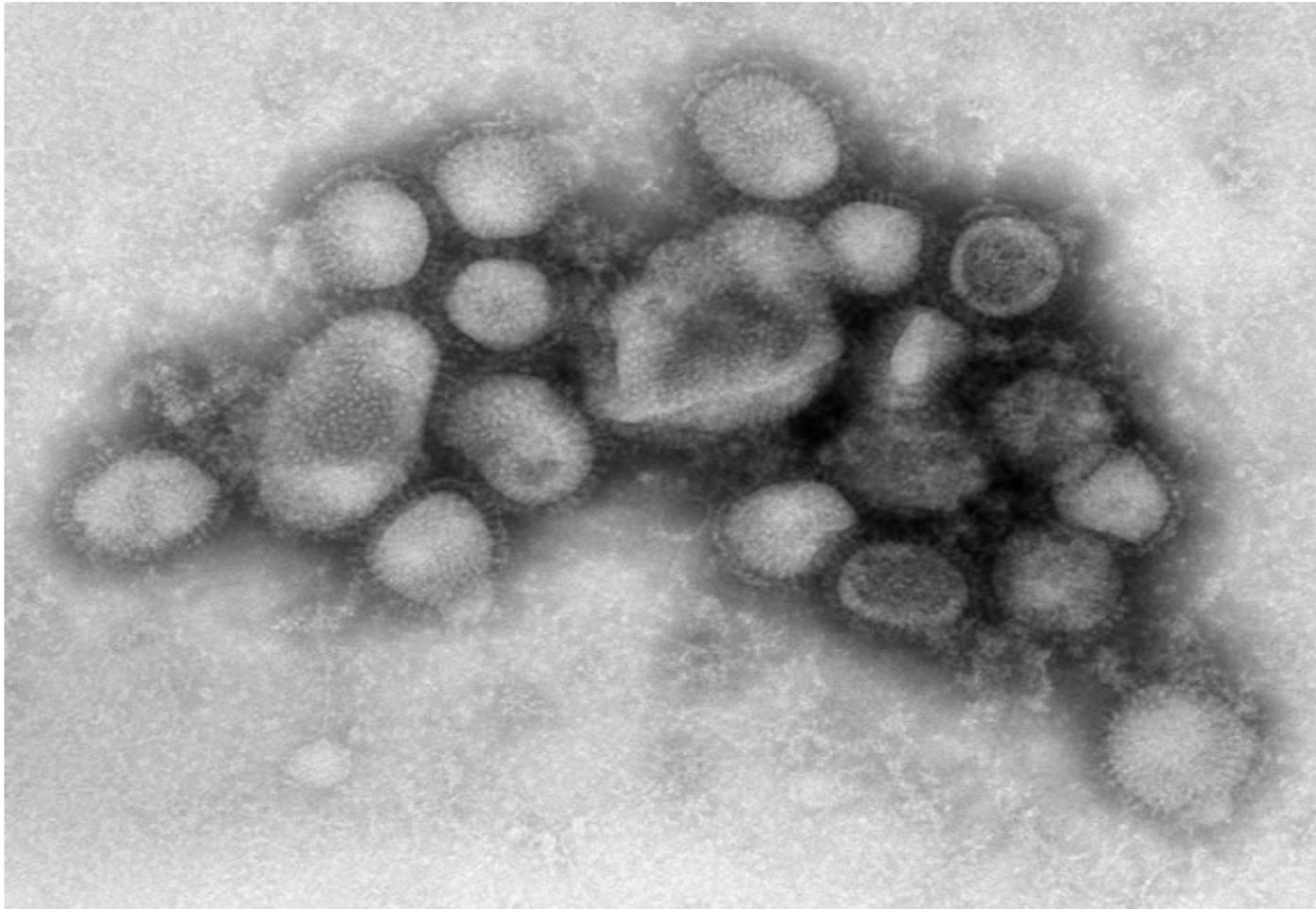




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# *Novel Influenza A (H1N1)*

## *BCT 2009*

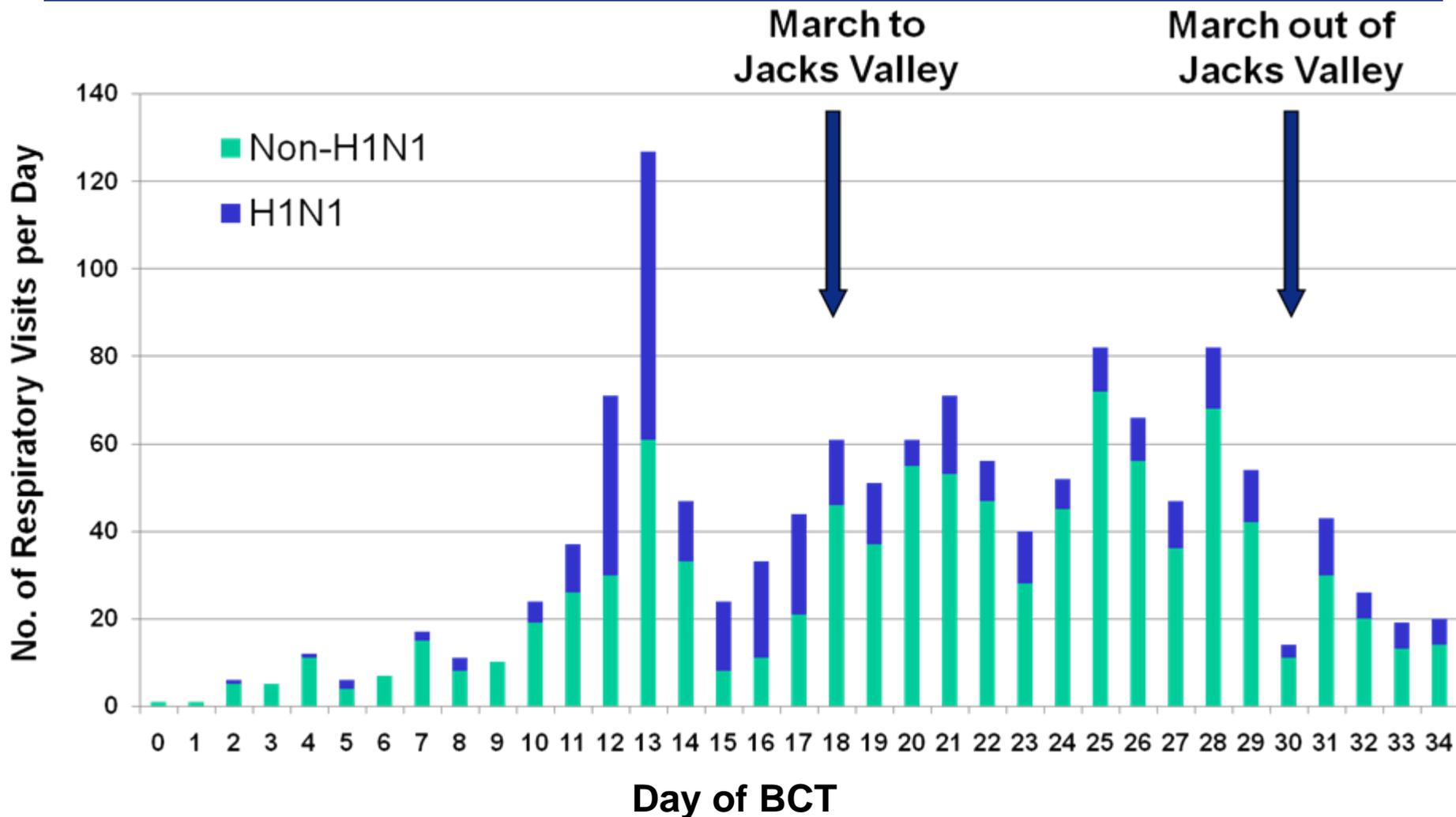


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# Respiratory Illnesses BCT 2009

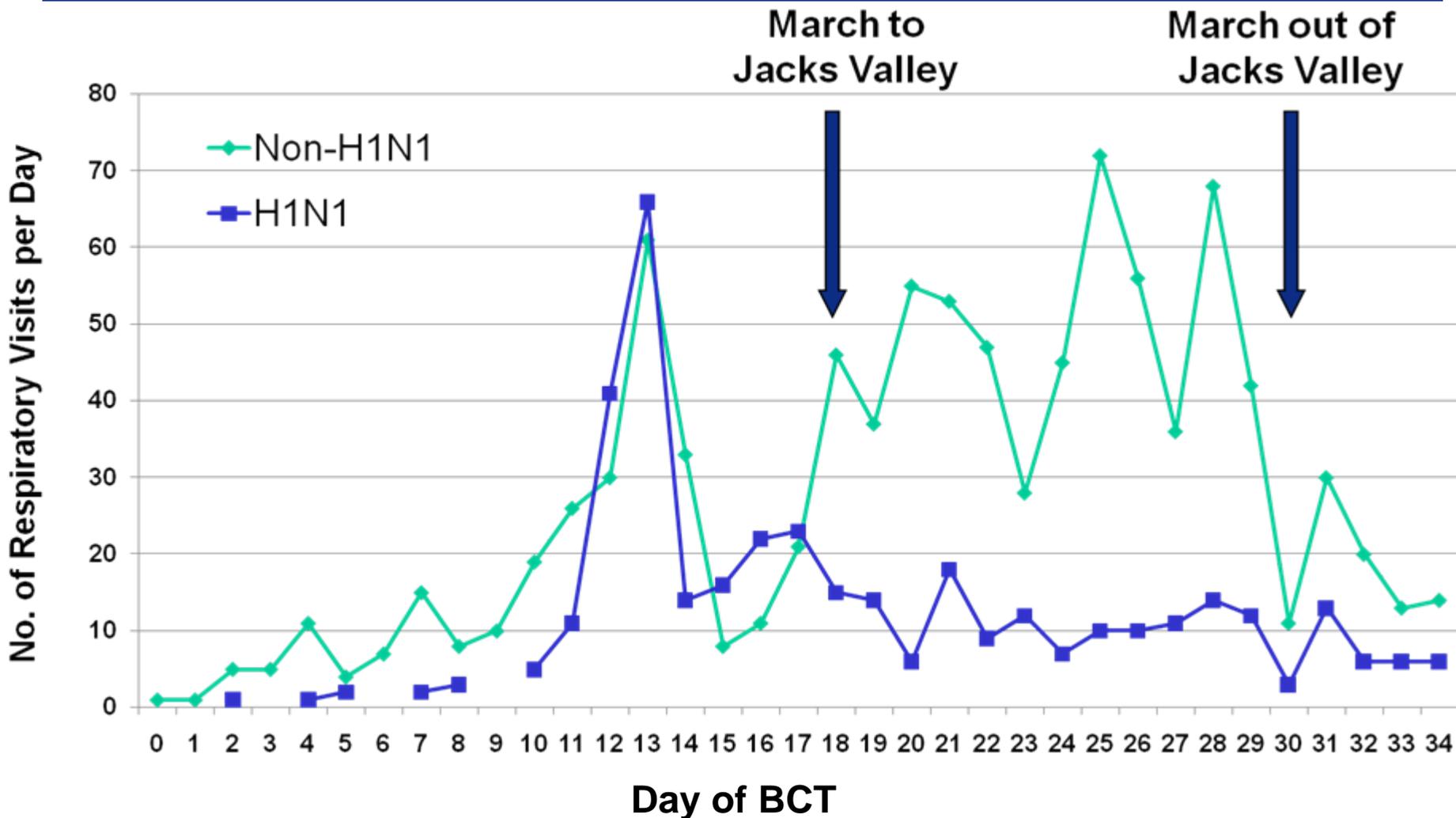


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# Respiratory Illnesses BCT 2009



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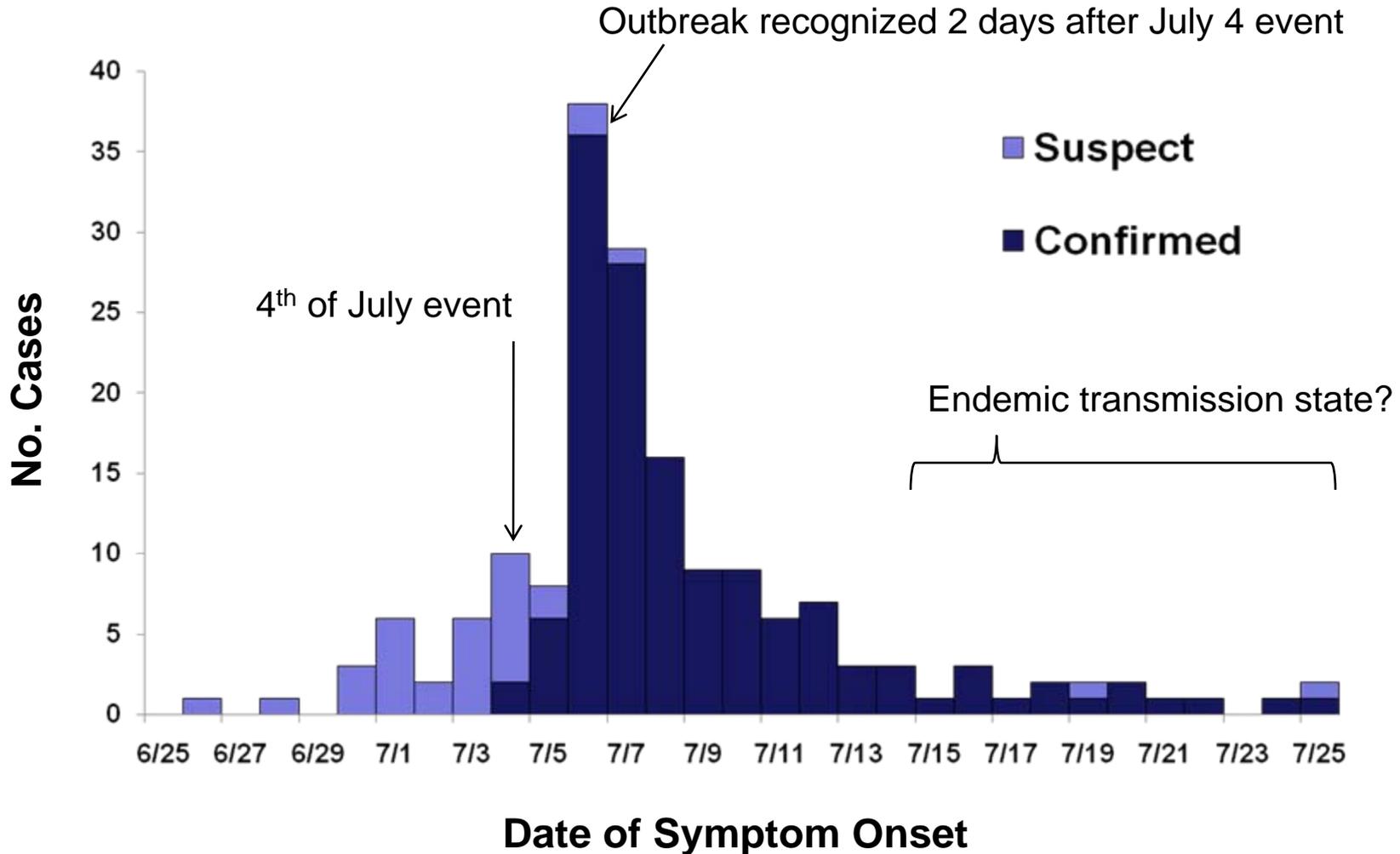
# *Preliminary Results*

- Adenovirus not etiologic agent
- Rhinovirus most commonly identified pathogen
- Bordetella species (non-Pertussis) identified in a number of individuals
- Influenza A/H1N1 identified in early specimens
- Influenza A/H1N1 identified in some subjects who did not meet CDC criteria for influenza-like illness



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# Epidemiologic Curve





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# *July 4<sup>th</sup> “Mixing Bowl”*



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# ***Opportunities from H1N1 Outbreak***

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- **Share lessons learned from containing an outbreak**
  - **Large training/university setting**
  
- **Highlight involvement of non-medical participation**
  
- **Utilize experience for planning**
  - **Screening protocols**
  - **Preventive measures**
  - **Rapid response**
  
- **Analyze data from serial shedding study**



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# *Shedding Duration*

- **Subset of isolated cadets**
  - **Serial nasal wash performed**
  - **Documented temperature at repeat sampling**
  - **Documented first date asymptomatic**
  
- **Samples tested by rRT PCR; if positive, then cultured**
  - **(+) on culture = evidence of viable virus shedding**
  
- **Analyze shedding duration relative to**
  - **Symptom onset, resolution, defervescence**
  - **Oseltamivir treatment factored into analysis**



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## *In Summary*

- **Typical respiratory morbidity during BCT 2009 confounded by nH1N1 outbreak**
- **Adenovirus not an etiologic factor in Jacks' Hack during BCT 2009**
- **Rhinovirus most commonly identified virus in patients with respiratory illness who did not have H1N1**
- **nH1N1 outbreak at USAFA provided a unique opportunity to better understand shedding of H1N1**



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