

## Asthma Surveillance at the National Level

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## Aim of the CDC Asthma Program

- Reduce the burden of asthma through better application of the current knowledge of medical and environmental management



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## NCEH: Our asthma portfolio

- Surveillance
  - Analyses / new systems / new methods
- Implementation of scientifically proven interventions
  - Controlling asthma in American cities
  - State grants
- Partnerships and training



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## Surveillance Activities

- **Periodic Surveillance Reports**
  - Analysis of existing data
- **New Data Sources**
  - Add to, revise and refine asthma questions on existing surveys
- **New Data Systems**
  - National Asthma survey



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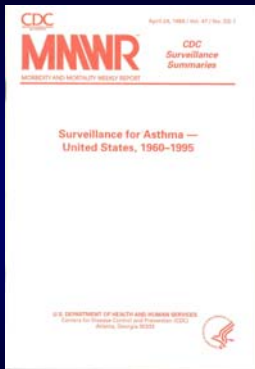
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## National Datasets of Importance to Asthma Surveillance and Research

- National Health Interview Survey (NHIS)
- National Vital Statistics System (NVSS)
- National Hospital Discharge Survey (NHDS)
- National Ambulatory Medical Care Survey (NAMCS)
- National Hospital Ambulatory Medical Care Survey (NHAMCS)
- National Health and Nutrition Examination Survey (NHANES)



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## National Health Interview Survey (NHIS)

- Asthma measure: prevalence
- Conducted annually by NCHS
- Purpose: monitor health of U.S. population
- Covers civilian non-institutionalized population
- Cross-sectional household interview survey; multi-stage area probability sample design
- Based on *self-report*




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## 1997 NHIS Redesign Changes for Asthma

- Pre 1997
  - 12-Month prevalence:
    - “During past 12 months, did anyone in the family have asthma?”
- Post 1997
  - Lifetime prevalence:
    - “Has a Doctor or other health professional ever told you that you have asthma?”
  - Attack Prevalence:
    - If yes, then asked “During past 12 months, had episode of asthma or asthma attack?”
  - Current prevalence, 2001+
    - “Do you still have asthma?”




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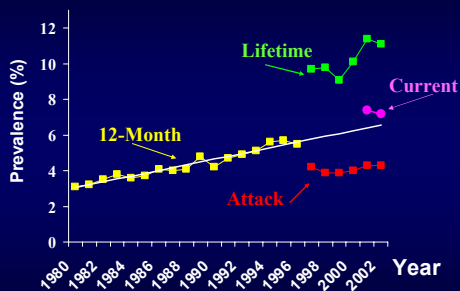
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## Asthma Prevalence

United States: 1980-2002



Source: National Health Interview Survey; National Center for Health Statistics




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## National Vital Statistics System (NVSS)

- Asthma measure: mortality
- Cooperative effort between NCHS, states
- NVSS represents federal compilation of data for deaths as mandated by law
- Represents report of all deaths
- Data available
  - for small geographic areas
  - over a long period of time



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## Underlying versus Multiple Cause of Death

- Underlying cause of death (UCD) – primary cause of death listed on death certificate
- Multiple cause of death (MCD) – includes other causes of death listed on death certificate but not considered to be primary cause of death



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## ICD codes for asthma

- ICD – International Classification of Diseases
  - Mortality
  - Non-mortality – use CM (clinical modification)
- ICD-9: 1979-1998
  - Asthma codes: 493 – 493.9
- ICD-10: 1999 mortality data
  - Asthma codes: J45-J46
  - Comparability index with ICD-9 for asthma: 0.89
- Clinical modification of ICD-10 still under development, thus still using ICD-9-CM for non-mortality outcomes



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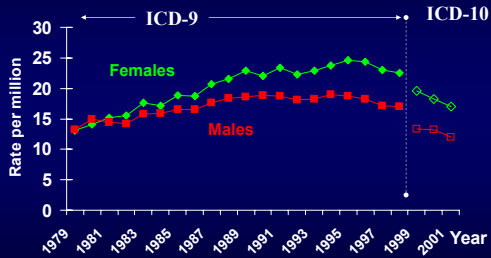
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## Asthma Mortality Rates\* by Sex, United States: 1979-2001



Source: Underlying Cause of Death; National Center for Health Statistics  
\* Age-adjusted to 2000 U.S. population




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## National Hospital Discharge Survey (NHDS)

- Asthma measure: hospitalizations
- Conducted annually by NCHS
- Encompasses patients discharged from non-institutional hospitals
- Excludes military and V.A. hospitals
- Includes only hospitals with 6 or more beds
- Prior to 1988, included only hospitals where average stay < 30 days
- 1988 redesign: all general and children's general hospitals included regardless of average length of stay
- Complex multi-stage sample design




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## NHDS Data

- Represents discharges, not individuals
- Seven diagnostic fields
  - Field 1: "first-listed" (primary) diagnosis
  - Fields 2-7: other listed diagnoses, not necessarily in order of importance
- Data on race missing for 5-20% of the sample
- Access to variance file available through data agreement with NCHS




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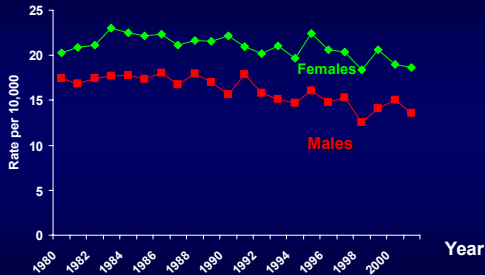
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### Asthma\* Hospital Discharge Rates# by Sex, United States: 1980–2001



Source: National Hospital Discharge Survey; National Center for Health Statistics  
\*First-listed diagnosis # Age-adjusted to 2000 U.S. population




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### National Ambulatory Medical Care Survey (NAMCS)

- Asthma measure: office visits
- Conducted annually by NCHS since 1989; prior, conducted from 1973-1981 and in 1985
- Sample of visits to nonfederally employed office-based physicians primarily engaged in direct patient care
- Excludes physicians in the specialties of anesthesiology, pathology, and radiology
- Data collected by physician, rather than patient
- Multistage probability design




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### National Hospital Ambulatory Medical Care Survey (NHAMCS)

- Asthma measure: emergency room visits
- Conducted annually by NCHS since 1992
- Sample of visits to emergency departments and outpatient departments of non-institutional general and short-stay hospitals
- Excludes Federal, military, and V.A. hospitals
- Data collected by hospital staff
- Multistage probability design




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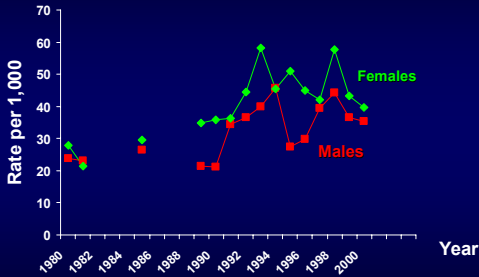
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### Asthma\* Office Visit Rates# by Sex, United States: 1980–2000



Source: National Ambulatory Care Survey; National Center for Health Statistics  
\* First-listed diagnosis # Age-adjusted to 2000 U.S. population




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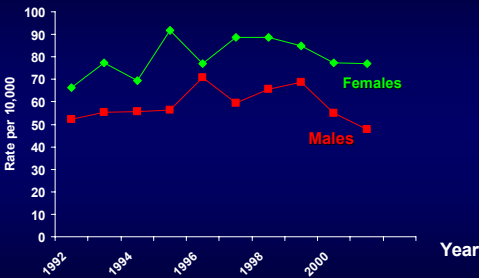
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### Asthma\* Emergency Department Rates# by Sex, United States: 1992–2001



Source: National Hospital Ambulatory Care Survey; National Center for Health Statistics  
\* First-listed diagnosis # Age-adjusted to 2000 U.S. population




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### Strengths and Limitations of National Datasets Currently Used for Asthma Surveillance

- Strengths
  - Data collected annually
  - Data collected using rigorous, standardized protocols
  - Estimates of measures available for national, regional level
- Limitations
  - Miscoding possible in all datasets
  - Prevalence based on self-report
  - Exact relationship of care utilization to prevalence not clear
  - Asthma mortality uncommon, poor indicator of prevalence
  - Except for mortality, most datasets can not provide information for small geographic areas
  - 2-3 year time lag between data collection and availability
  - Better suited for descriptive uses rather than research




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## National Health and Nutrition Examination Survey (NHANES)

- Collects information about health and diet of people in the U.S.
- Combines home interview with physical examination and laboratory tests
- Health tests done in Mobile Examination Center (MEC)
- History
  - NHANES I (1971-75): 28,000 subjects aged 1-74 yrs
  - NHANES II (1976-80): 28,000 subjects aged 6 mo – 74 yrs
  - HHANES (1982-84): 16,000 subjects of Mexican, Cuban, Puerto Rican heritage
  - NHANES III (1988-1994): 40,000 subjects aged 2 months and older
  - HANES Epidemiological Follow-Up Survey (since 1982): follow-up interviews with members of NHANES I cohort



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## Uses of NHANES for Asthma Surveillance and Research

- More conducive to research questions than other national datasets
- Vast number of data items regarding risk behaviors, physical exposures, and laboratory tests
- Multistage probability design: can obtain national estimates
- In past, conducted too sporadically to use for surveillance



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## Current NHANES

- Began in 1999
- *Continuous* survey
- 15 sites a year
- 5,000 surveyed annually
- Another source of asthma prevalence
  - Limited age groups
- However, does *not* include spirometry



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## New Data Sources

- Questions on asthma added to:
  - NHIS supplement
  - BRFSS
  - Longitudinal Survey of Youth



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## BRFSS

- World's largest telephone survey
- Joint CDC/State program
- Measures primarily include health related behavioral risk factors
- Random Adult (18+, civilian non-institutional population)
- Average of 4,000 completed interviews per state
- Standard set of core questions
- Rotating core questions
- Emerging core questions
- Optional modules
- State added questions



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## History of Asthma on BRFSS

- Before 1999 sporadic state-added asthma questions, inconsistent wording
- 1999 a 2-question optional module used in 17 states and 2 areas (DC and Puerto Rico)
- 2000 - 2 questions on the emerging core (all states and areas)
- 2001-2009 2 questions on the core every year
- 11-question module for use since 2001
  - Split into 9-question and 2-question for 2002-9
  - Proposals to change question wording for 2005



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## National Longitudinal Survey of Youth

- Sponsored by the Bureau of Labor Statistics
- 12,686 respondents age 14-22 in 1979
  - Annual interviews
- 10,918 children of the women in the survey
  - Interviewed every 2 years since 1986
- Lifetime & current asthma prevalence questions
- 8 Other questions on asthma
  - Some similar to BRFSS
- Expect the data: Spring 2005



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## New Data Systems: National Asthma Survey

- National scope
- Large N for each area
- State and city level data
- Consistent, detailed asthma data
- SLAITS used for pilot tests
  - National Immunization Survey
- RFC will be released shortly



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## Asthma Surveillance at the National Level

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