# Evaluation of Austrian measles surveillance, 2009-2013

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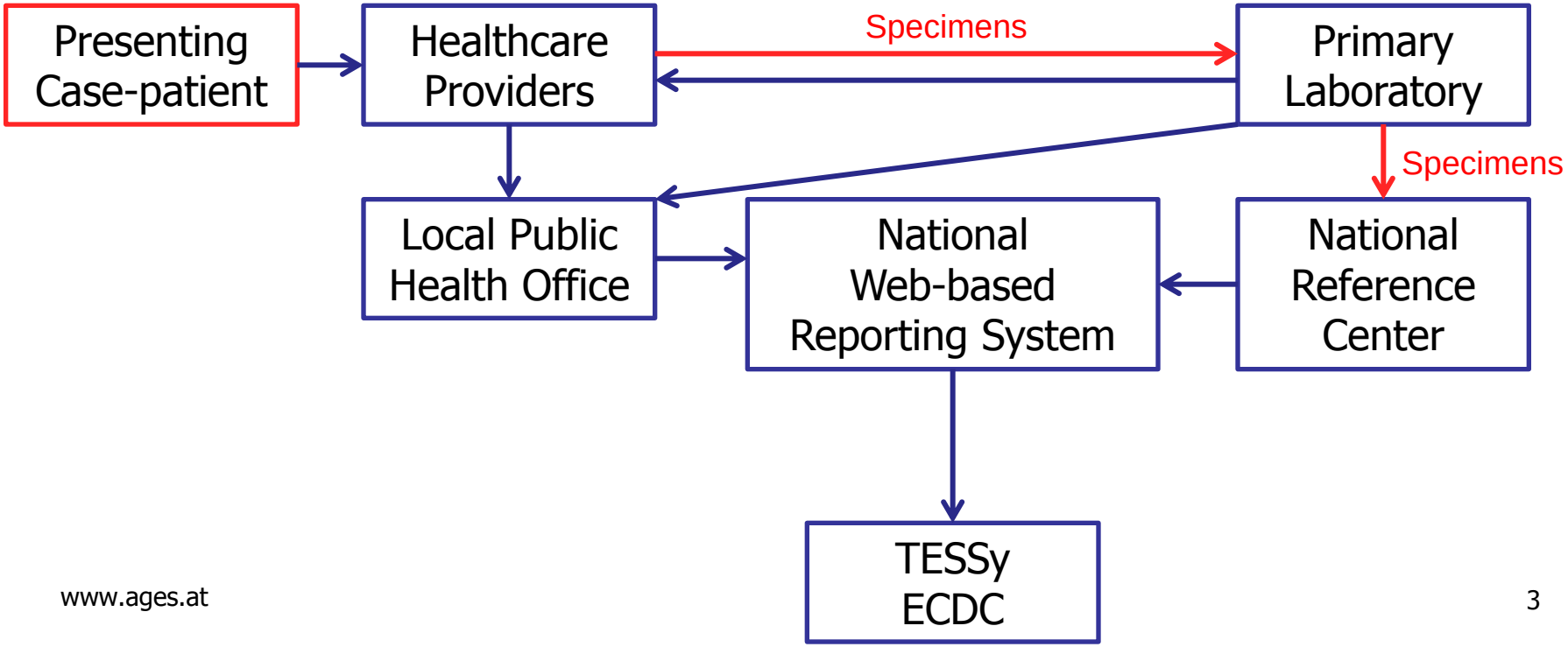
3.Austrian Ministry of Health

# Background I

- Measles elimination
  - Absence of endemic measles in a defined geographical area ≥ 12 months
  - By 2015 in European Region
- Strategies
  - ≥ 95% coverage with two doses of immunization
  - Provide vaccination opportunities and high quality, evidence-based immunization information
  - Surveillance systems with rigorous case investigation and laboratory confirmation

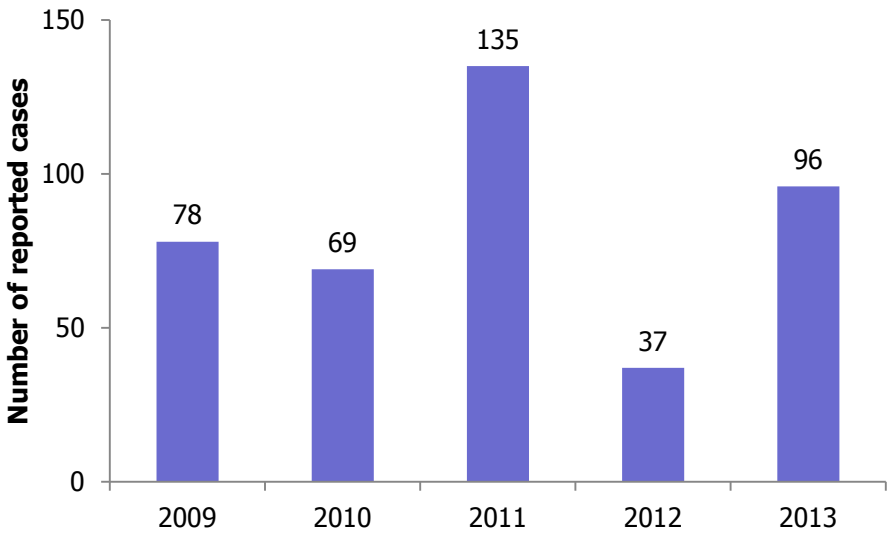
# Background II

- Measles notifiable in Austria since 2002
- National web-based reporting since 2009
- Case definitions comply with ECDC definitions

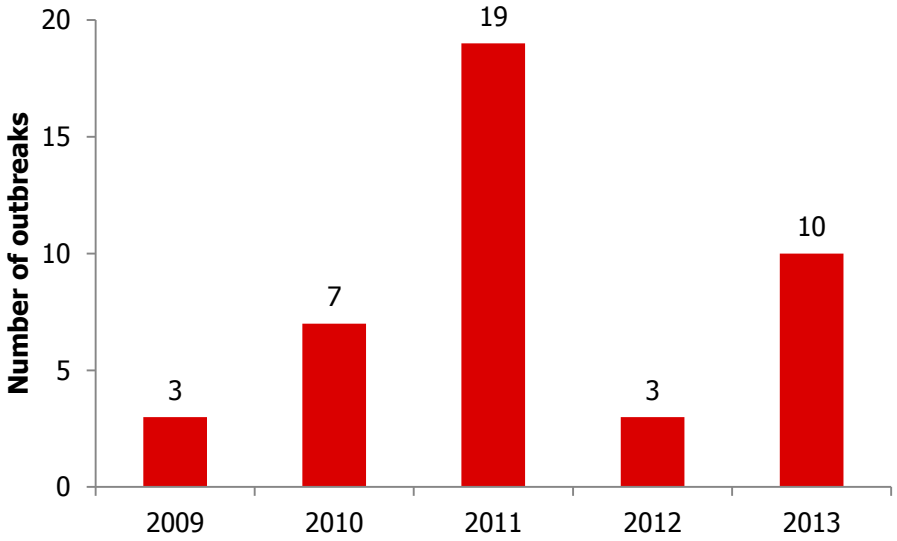


# Background III

**Number of reported measles cases, Austria, 2009-2013**




**Number of measles outbreaks, Austria, 2009-2013**




Median age: 18 years (range: 0-97)
Male:Female = 1.2:1

Size of outbreaks:
Median: 2.5 cases/outbreak
Range: 2-35 cases/outbreak

- Aim
  - To identify areas for improving measles surveillance in Austria

- Objectives
  - To evaluate the attributes of Austrian measles surveillance system
  - To assess the performance of Austrian measles surveillance system using WHO surveillance performance indicators

# Methods I

- Data source: 415 reported case-records in Austrian national web-based reporting system, 2009-2013

- Attributes (CDC) and performance indicators (WHO)
  - Data completeness
  - Reporting timeliness
  - Laboratory investigations
  - Rate of discarded cases
  - Proportion of outbreaks investigated for virus genotypes

# Methods II

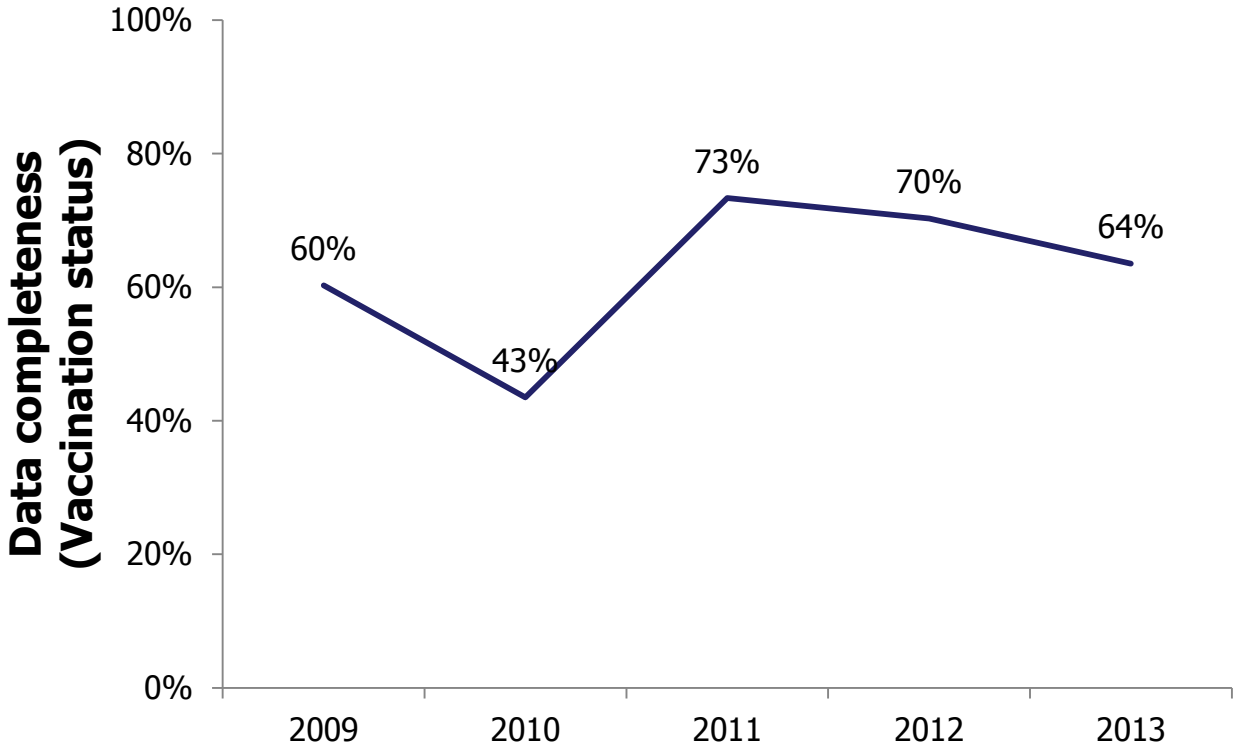
- Data completeness (vaccination status)
  - Proportion of reported cases with complete vaccination status data
- Reporting timeliness
  - Proportion of reported cases reported by healthcare providers ≤1 days after clinical diagnosis
  - WHO target: ≥80%
- Laboratory investigations
  - Proportion of reported cases tested in laboratories
  - WHO target: ≥80%

# Methods III

- Rate of discarded cases
  - Rates of reported cases discarded as non-measles cases using laboratory testing among general population
  - A proxy for sensitivity
  - WHO target: ≥2/100,000 population per year
- Proportion of outbreaks investigated for virus genotypes
  - Proportion of outbreaks investigated for virus genotypes
  - WHO target: ≥80%

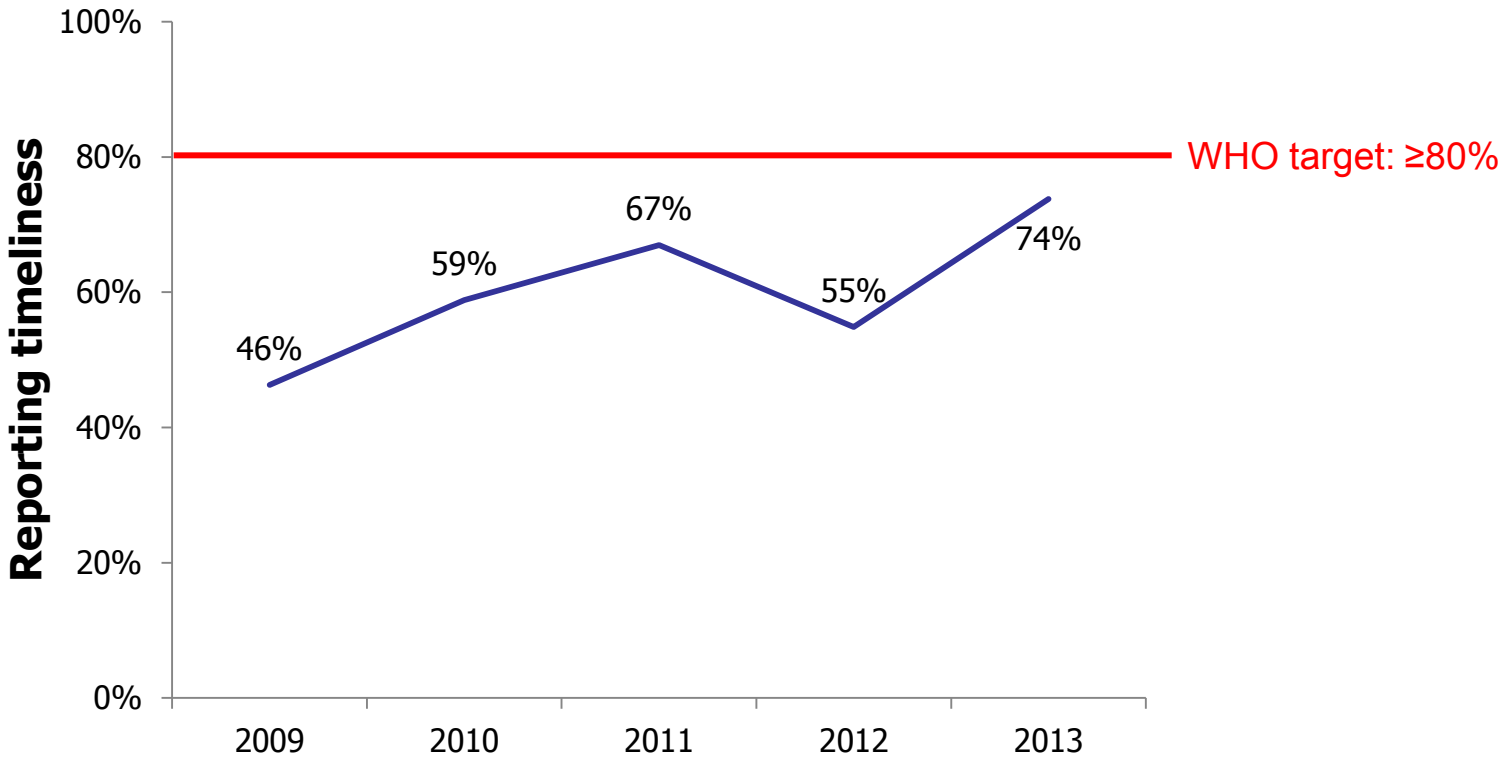
# Data completeness

Proportion of case-records with complete vaccination status data, Austria, 2009-2013 (n=415)



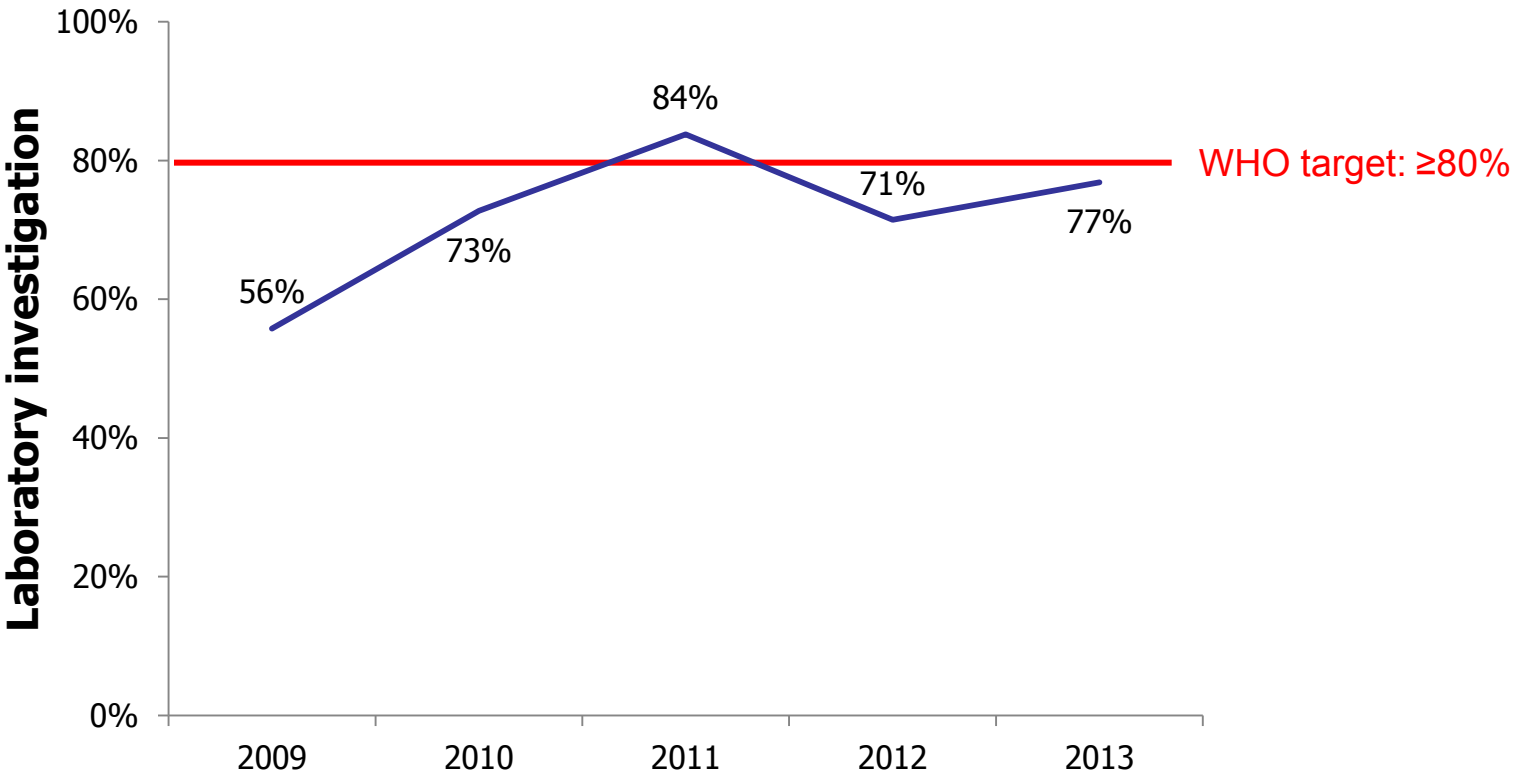
# Reporting timeliness

Proportion of reported cases with timely reporting, Austria, 2009-2013 (n=309)



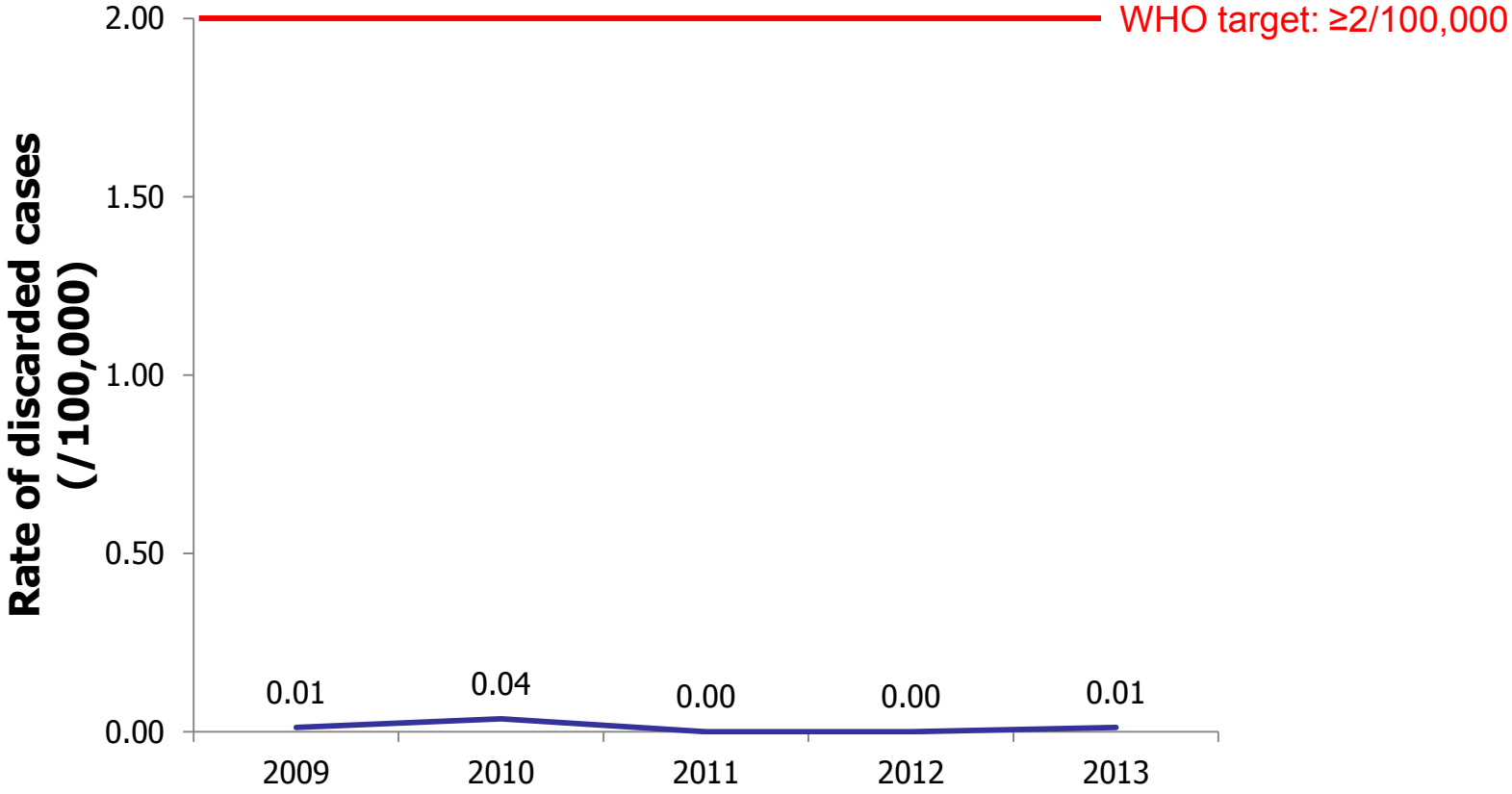
# Laboratory investigation

Proportion of reported cases with laboratory investigation, Austria, 2009-2013 (n=345)



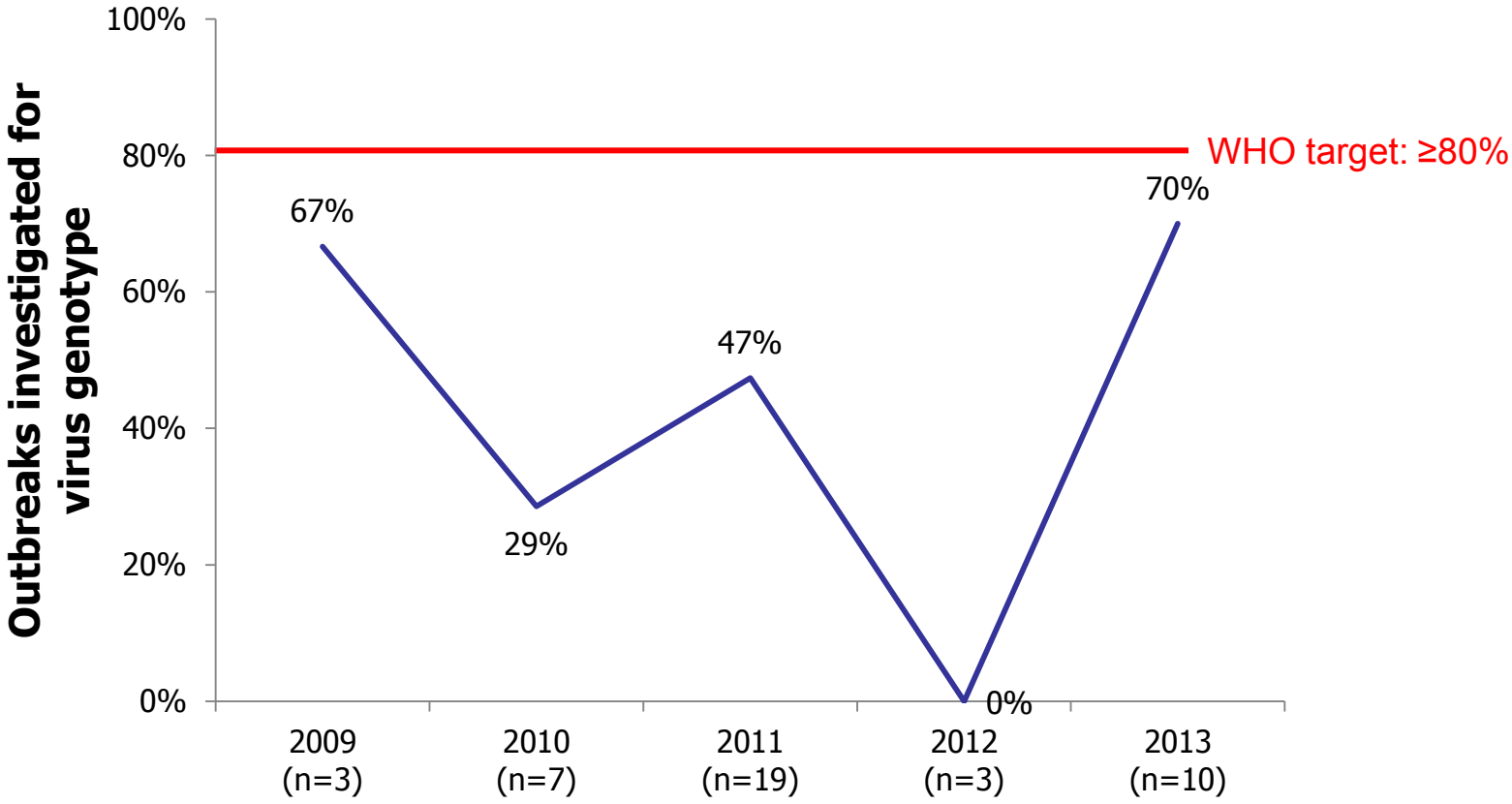
# Rate of discarded cases

Rate of discarded cases, Austria, 2009-2013



# Outbreaks investigated for genotypes

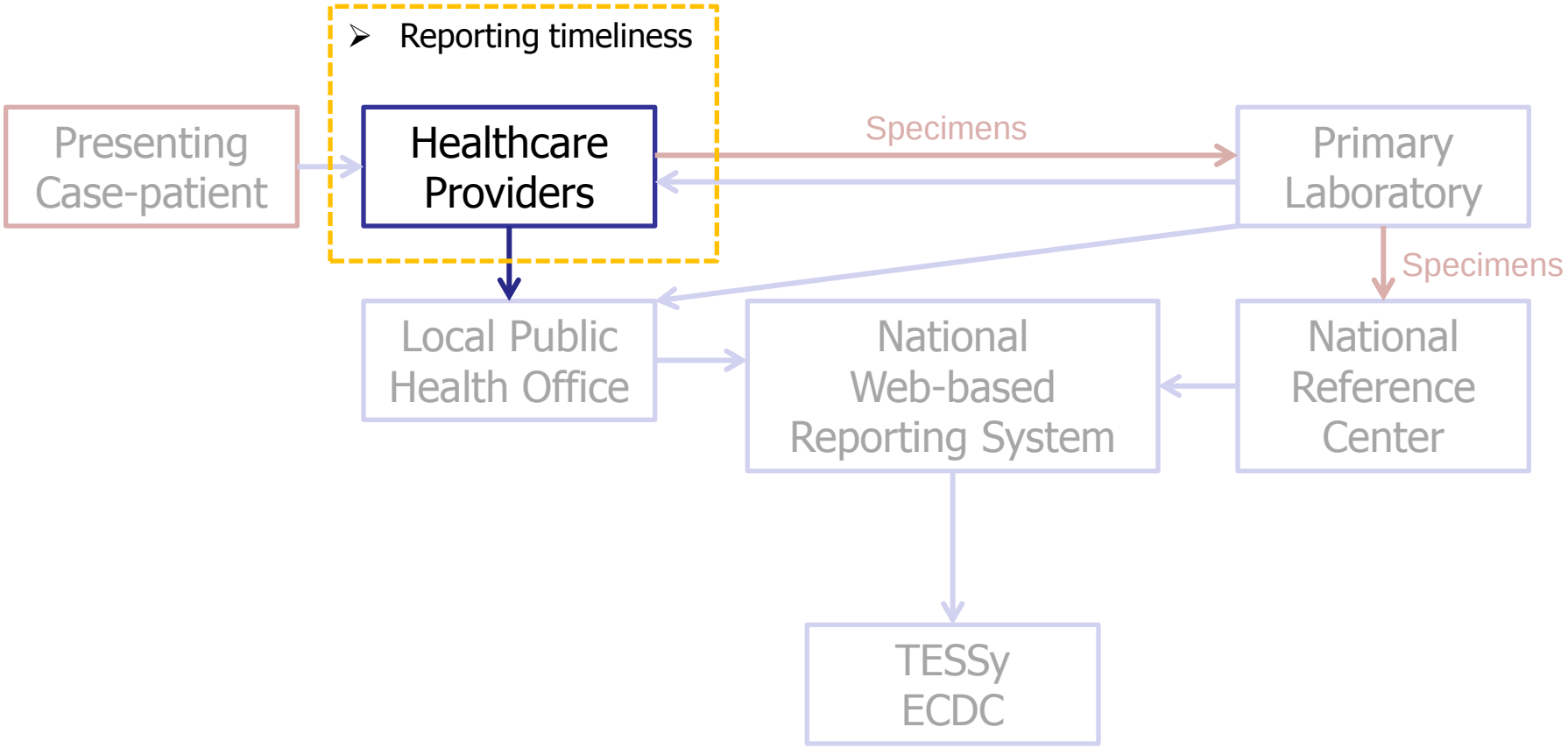
Proportion of outbreaks investigated for genotypes, Austria, 2009-2013 (n=42)



# Results summary

| Attributes/Indicators | WHO Target | Median (Range) |
|---|---|---|
| Data completeness | - | 64% (43%-73%) |
| Reporting timeliness | ≥80% | 59% (46%-74%) |
| Laboratory investigation | ≥80% | 73% (56%-84%) |
| Rate of discarded cases | ≥2/100,000 | 0.01/100,000 (0-0.04) |
| Outbreaks investigated for virus genotypes | ≥80% | 47% (0%-70%) |

# Roles of attributes/indicators



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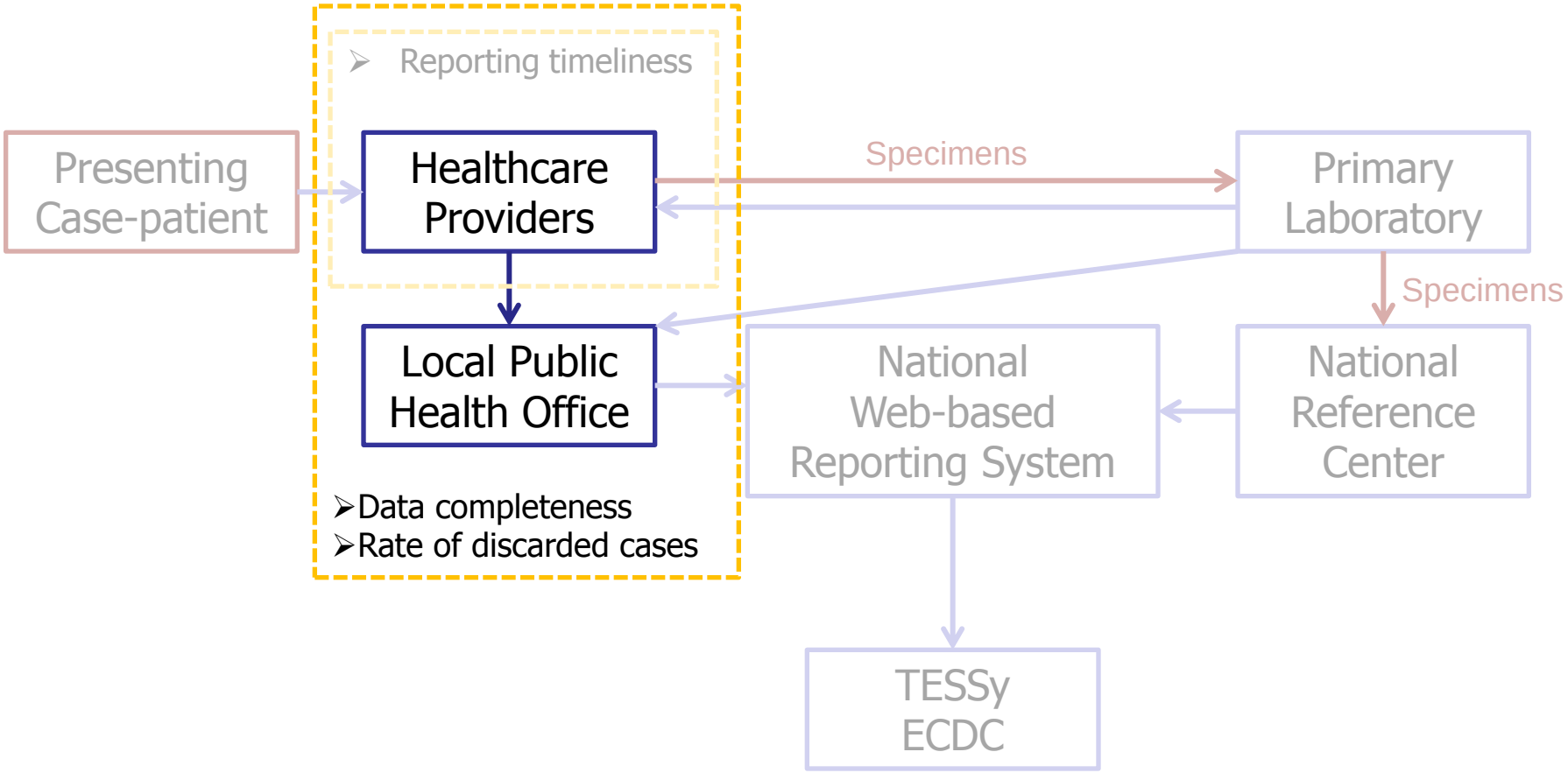

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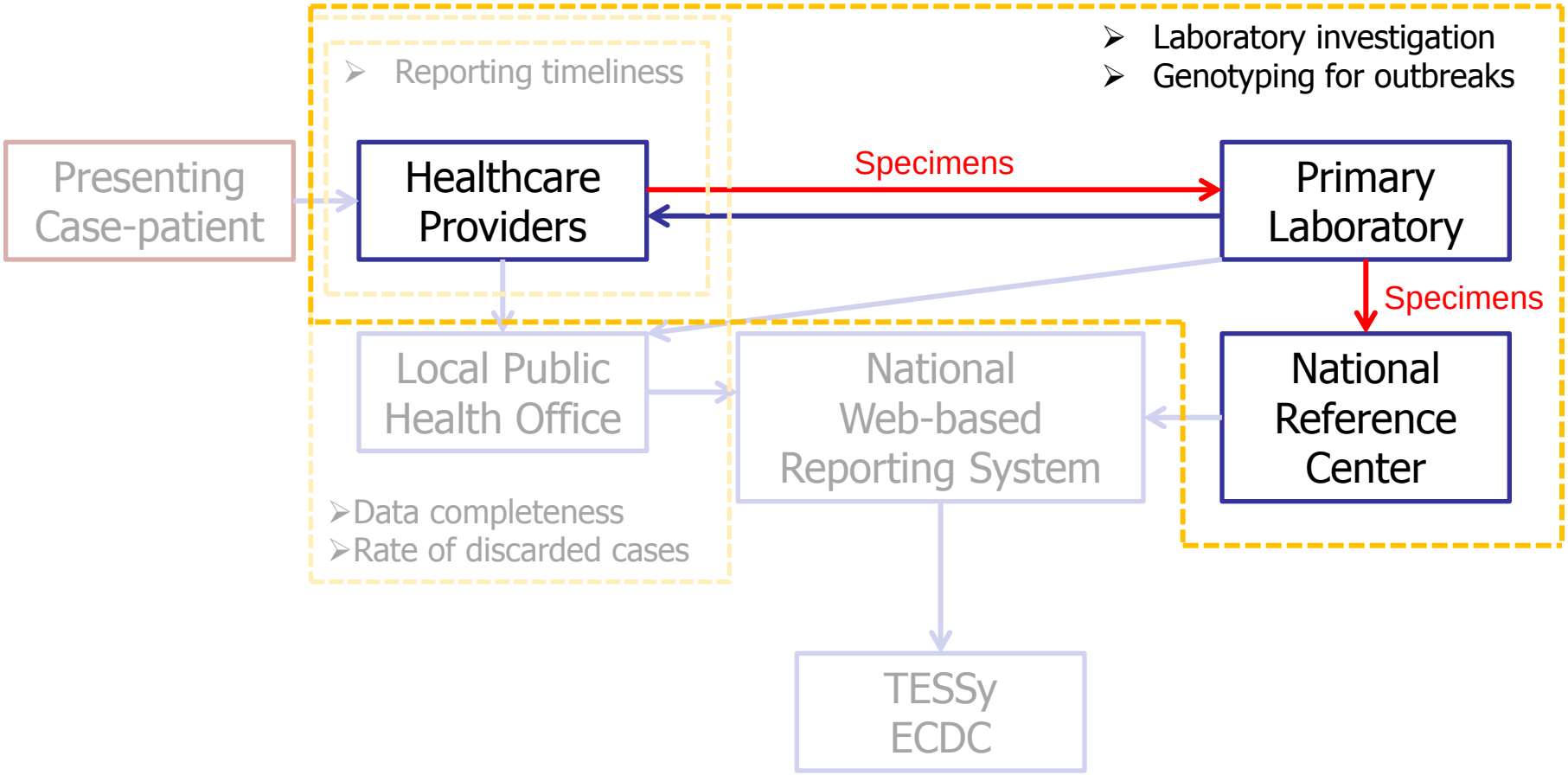

# Possible explanations I

- Reporting timeliness
  - Low acceptability of notification obligation among healthcare providers
  - Healthcare providers awaiting laboratory confirmation
- Rate of discarded cases
  - Under-reporting by healthcare providers or public health authorities
  - Under-utilization of medical resources by the public

# Possible explanations II

- Data completeness
  - Unattainable data from healthcare providers and district public health authorities
- Laboratory investigation and genotyping
  - Specimen submission and laboratory result reporting among healthcare providers, primary laboratories and national reference center

# Limitations

- Data validity not checked
  - 23 of 415 case-records with dates of report earlier than dates of diagnosis were excluded in reporting timeliness analysis

# Conclusion

- In 2009-2013, none of the attributes/indicators of Austrian measles surveillance system met WHO targets sustainably

- Root causes of under-performance of the surveillance system need to be identified

# Recommendations

- To conduct a knowledge/attitude/practice survey among healthcare providers and local public health authorities to understand reporting behavior

- To conduct a survey among primary laboratories and the national reference center on reporting behavior and specimen submission for genotyping


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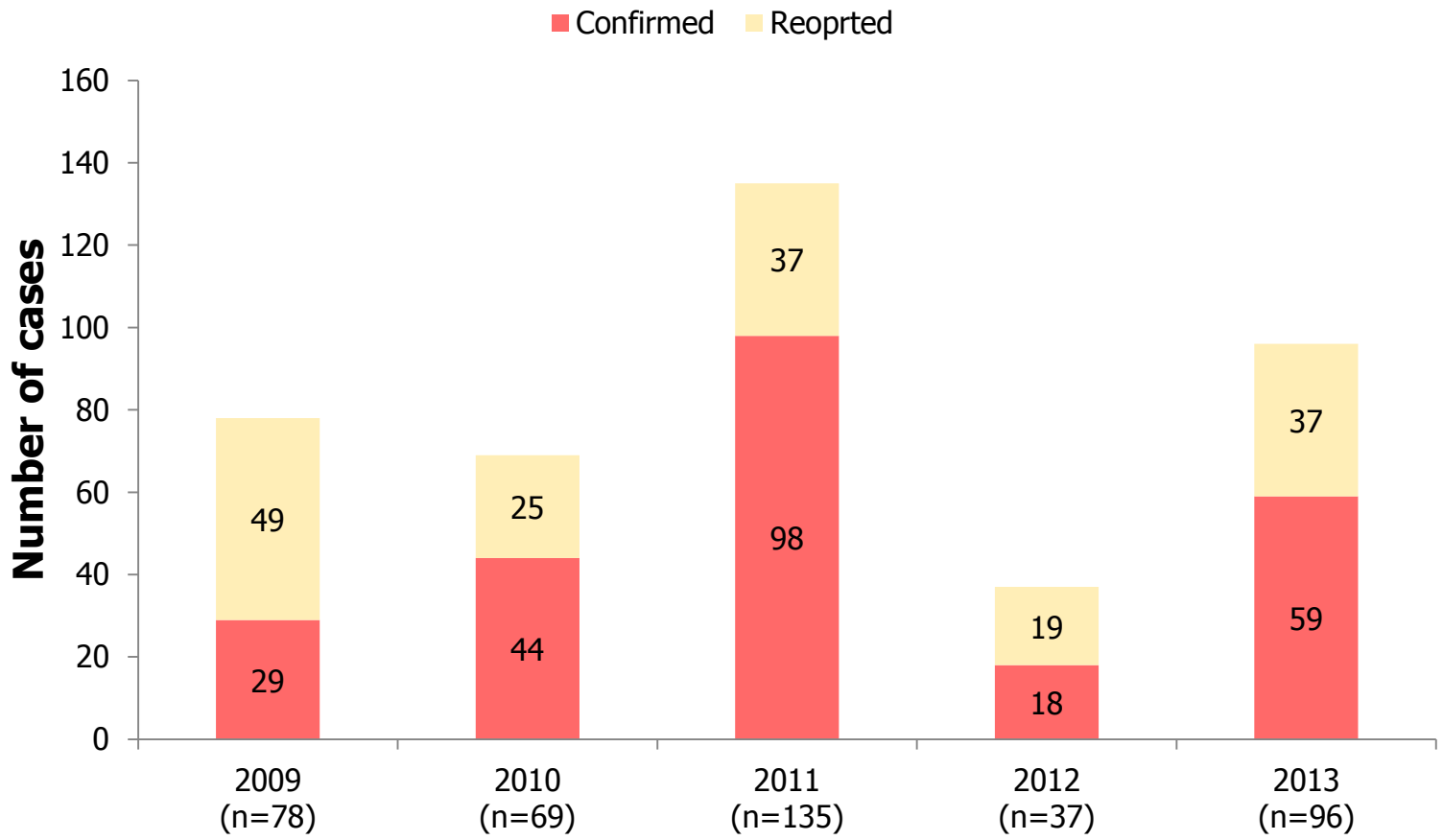
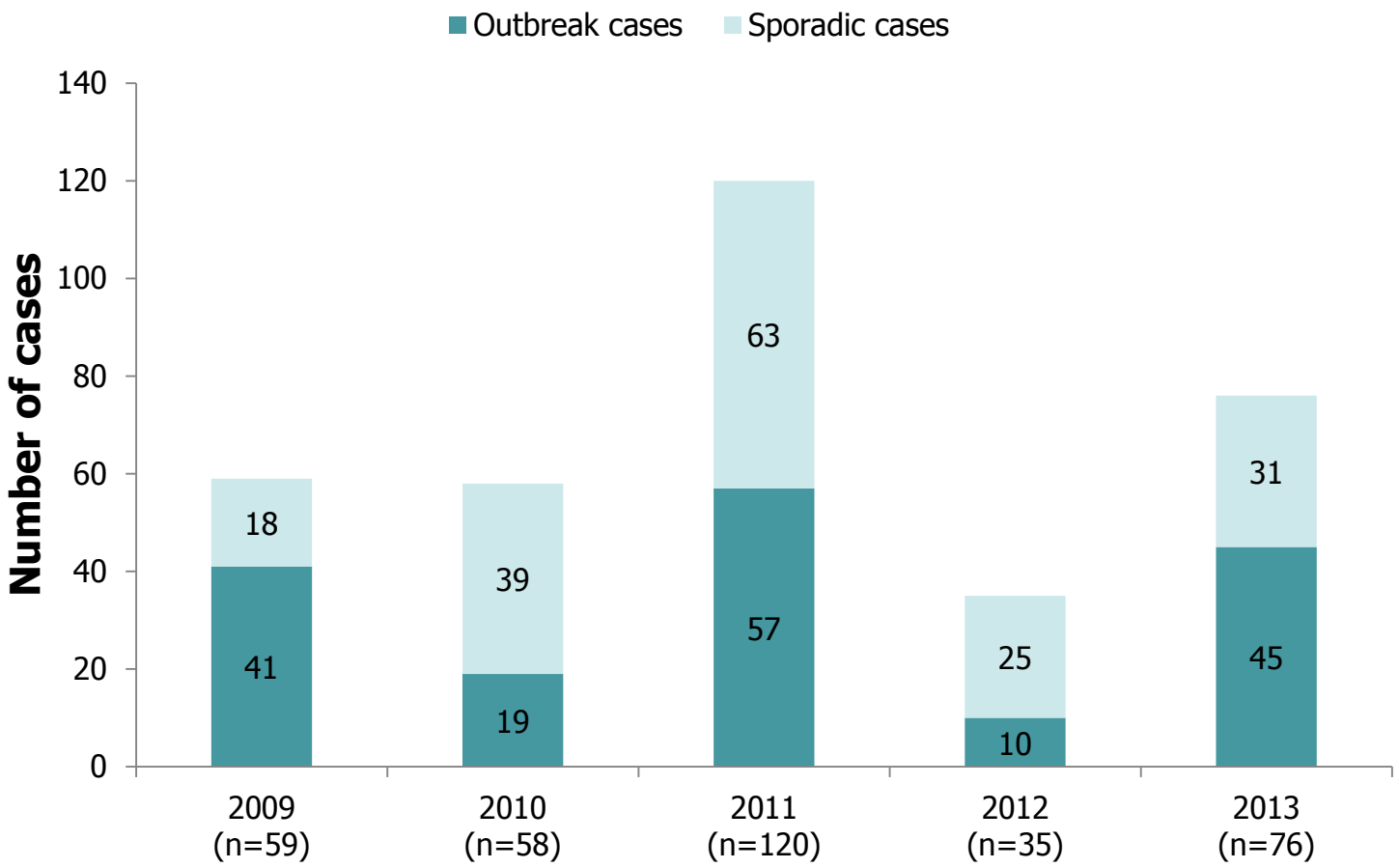
# Table

| Year (Number of reported cases) | Data completeness | Reporting timeliness | Laboratory investigation | Discarded cases | Outbreaks investigated for genotype |
|---|---|---|---|---|---|
| 2009 (n=78) | 47/78 (60%) | 25/54 (46%) | 29/52 (56%) | 0.01/100,000 | 2/3 (67%) |
| 2010 (n=69) | 30/69 (43%) | 30/51 (59%) | 48/66 (73%) | 0.04/100,000 | 2/7 (29%) |
| 2011 (n=135) | 99/135 (73%) | 75/112 (67%) | 98/117 (84%) | 0/100,000 | 9/19 (47%) |
| 2012 (n=37) | 26/37 (70%) | 17/31 (55%) | 20/28 (71%) | 0/100,000 | 0/3 (0%) |
| 2013 (n=96) | 61/96 (64%) | 45/61 (74%) | 63/82 (77%) | 0.01/100,000 | 7/10 (70%) |
| WHO targets | - | ≥80% | ≥80% | ≥2/100,000 | ≥80% |

# Number of measles cases, Austria, 2009-2013

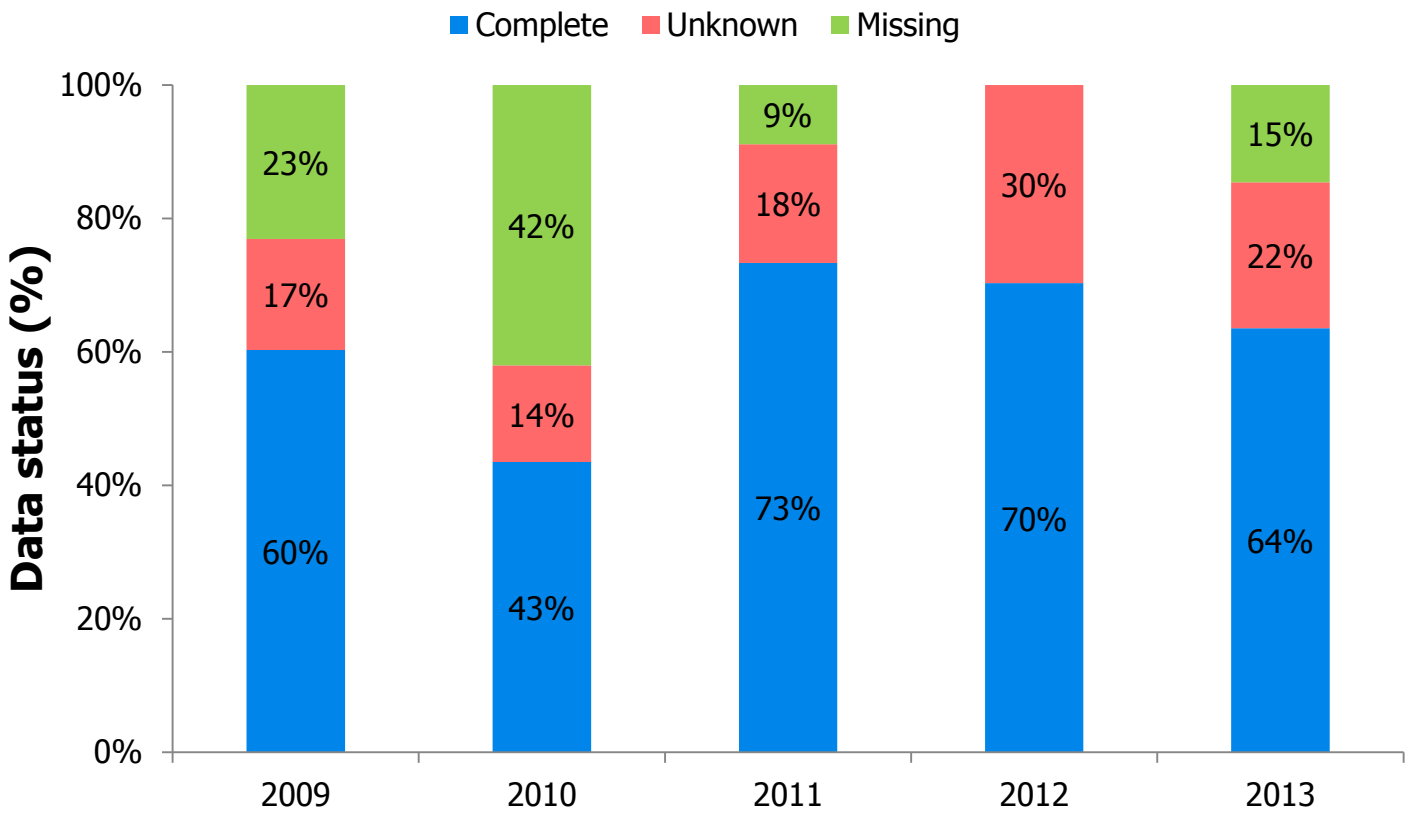


# Number of outbreak and sporadic measles cases, Austria, 2009-2013



# Data Completeness

- Data status of vaccination status, Austria, 2009-2013



# Reporting Timeliness

- Data status of reporting timeliness, Austria, 2009-2013

| | Valid dates | Diagnosis earlier than report | No diagnosis date | No report date | No diagnosis and report dates |
|---|---|---|---|---|---|
| 2009 | 54 (69%) | 4 (5%) | 1 (1%) | 10 (13%) | 9 (12%) |
| 2010 | 51 (74%) | 4 (6%) | 11 (16%) | 2 (3%) | 1 (1%) |
| 2011 | 112 (83%) | 6 (4%) | 5 (4%) | 12 (9%) | 0 (0%) |
| 2012 | 31 (84%) | 2 (5%) | 2 (5%) | 2 (5%) | 0 (0%) |
| 2013 | 61 (64%) | 7 (7%) | 12 (13%) | 13 (14%) | 3 (3%) |
| Subtotal | 309 (74%) | 23 (6%) | 31 (7%) | 39 (9%) | 13 (3%) |