Massachusetts Department of Public Health

DPH

Invasive Group A *Streptococcus* Investigations in Healthcare Settings

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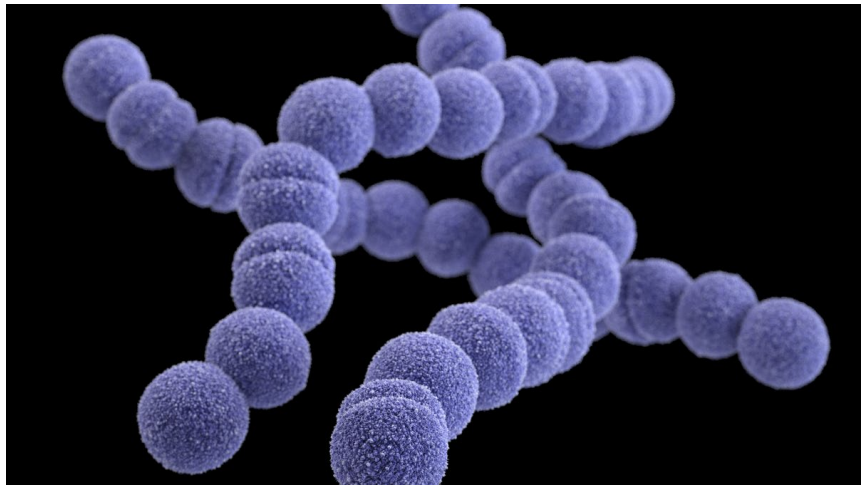
Objectives

- Provide an overview of group A *Streptococcus* (GAS) infections
- Review trends in invasive GAS infections in MA
- Discuss steps in case investigation for LBOHs and DPH epidemiologists
- Review Healthcare Associated Infections identified in GAS Investigations
- Review complicated investigations
  - Post-surgical
  - Post-partum
  - Long term care facilities (LTCF)
- Highlight additional GAS resources

Overview of Group A *Streptococcus* Infections (GAS)

What is GAS?

- Group A *Streptococcus* or *Streptococcus pyogenes*
  - Gram-positive, cocci bacteria found in throat and on skin
- Can cause invasive and noninvasive disease
  - Noninvasive disease, such as strep throat or impetigo, is more common
  - Invasive infection of normally sterile sites (ex. blood stream infections) is less common but can lead to severe illness
- Can colonize without causing symptoms
  - Carriage can be as high as 15%



About Group A Strep Infection | Group A Strep | CDC

How does GAS Spread?

- Spread by direct contact with nose and throat secretions or infected skin lesions
- The risk of spread is greatest when an individual is symptomatic, such as with strep throat or an infected wound
- Individuals who carry the bacteria but have no symptoms (colonized) are much less contagious

Incubation Period

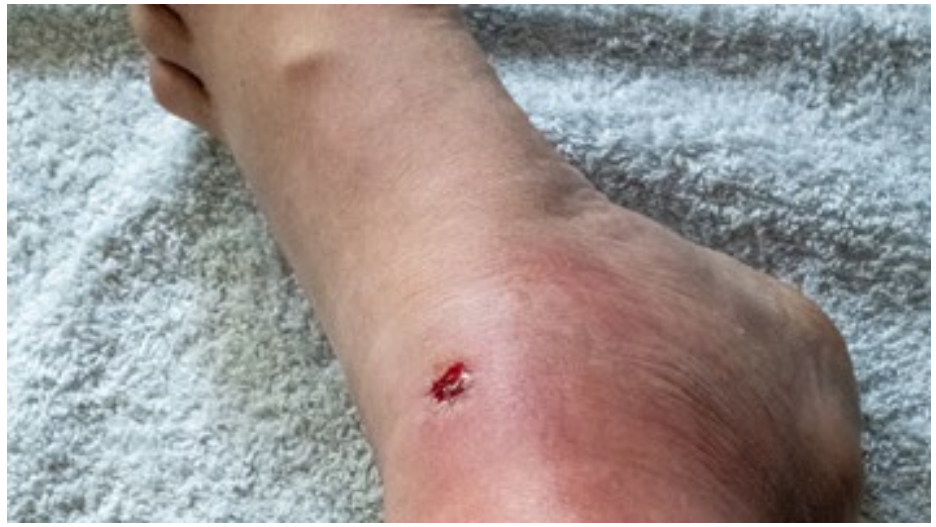
- Noninvasive: The incubation period for GAS pharyngitis is usually short (1-5 days)
- Invasive: The incubation period for invasive GAS is generally 2-5 days but can be longer

Infectious Period

- Appropriate antibiotic treatment for at least 24 hours is sufficient to end the individual's infectious period.
- Infectious period for **untreated** individuals:
  - In untreated GAS disease, the infectious period starts several days before onset of symptoms and lasts 10-21 days.
  - If purulent discharge is present, the infectious period may be extended from weeks to months.
  - Persons with untreated GAS pharyngitis may carry and transmit the bacteria for weeks or months, with contagiousness sharply decreasing 2-3 weeks after onset of illness.

Invasive GAS Infection

- Invasive disease occurs when bacteria get past defenses and invade normally sterile parts of the body, such as the blood, deep muscle, fat tissue, or the lungs.
- Infection may occur when a person has sores or other breaks in the skin (such as cuts or surgical wounds) that allow the bacteria to get into the tissue.



Clinical Guidance for Group A Streptococcal Cellulitis | Group A Strep | CDC

Invasive GAS Infection

- Although healthy people can get invasive GAS disease, people with chronic illnesses such as cancer, diabetes, and end stage renal disease, and those who require dialysis or use medications such as steroids, are at higher risk.
- Injection drug use is also a risk factor for invasive GAS.
- Some strains of GAS are more likely to cause severe disease than others.
  - The reason why some strains may cause more severe illness is not entirely clear but may involve the production of toxins that cause shock and organ damage and enzymes that cause tissue destruction.

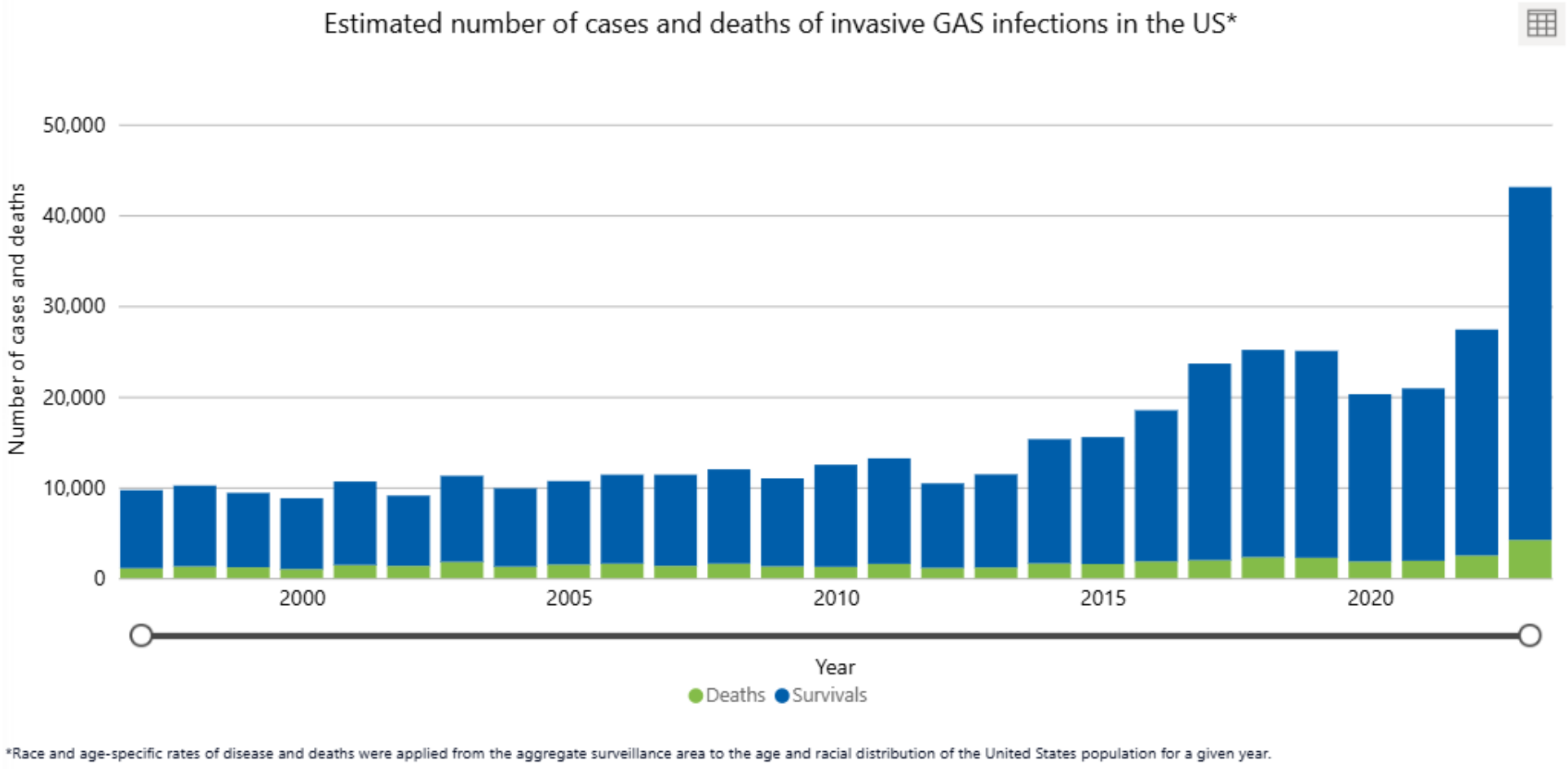
Clinical Presentation of Invasive GAS Infection

Invasive GAS infection may manifest as any of several clinical syndromes*, including:

Pneumonia (lung infection)	Bacteremia (bacteria in bloodstream)	Necrotizing Fasciitis (NF) (flesh-eating disease) 33% mortality rate; can result in amputation	Peritonitis (severe inflammation of abdomen tissue)
Osteomyelitis (infection in bone)	Septic Arthritis (joint infection)	Toxic Shock Syndrome (TSS) 30-70% mortality rate; can result in organ failure	Post-partum Sepsis (i.e., puerperal fever) (bacterial infection in reproductive tract)

**Listed in MAVEN Clinical Question Package as "Type of Infection." More than one may be applicable.*

GAS Infections in the U.S.

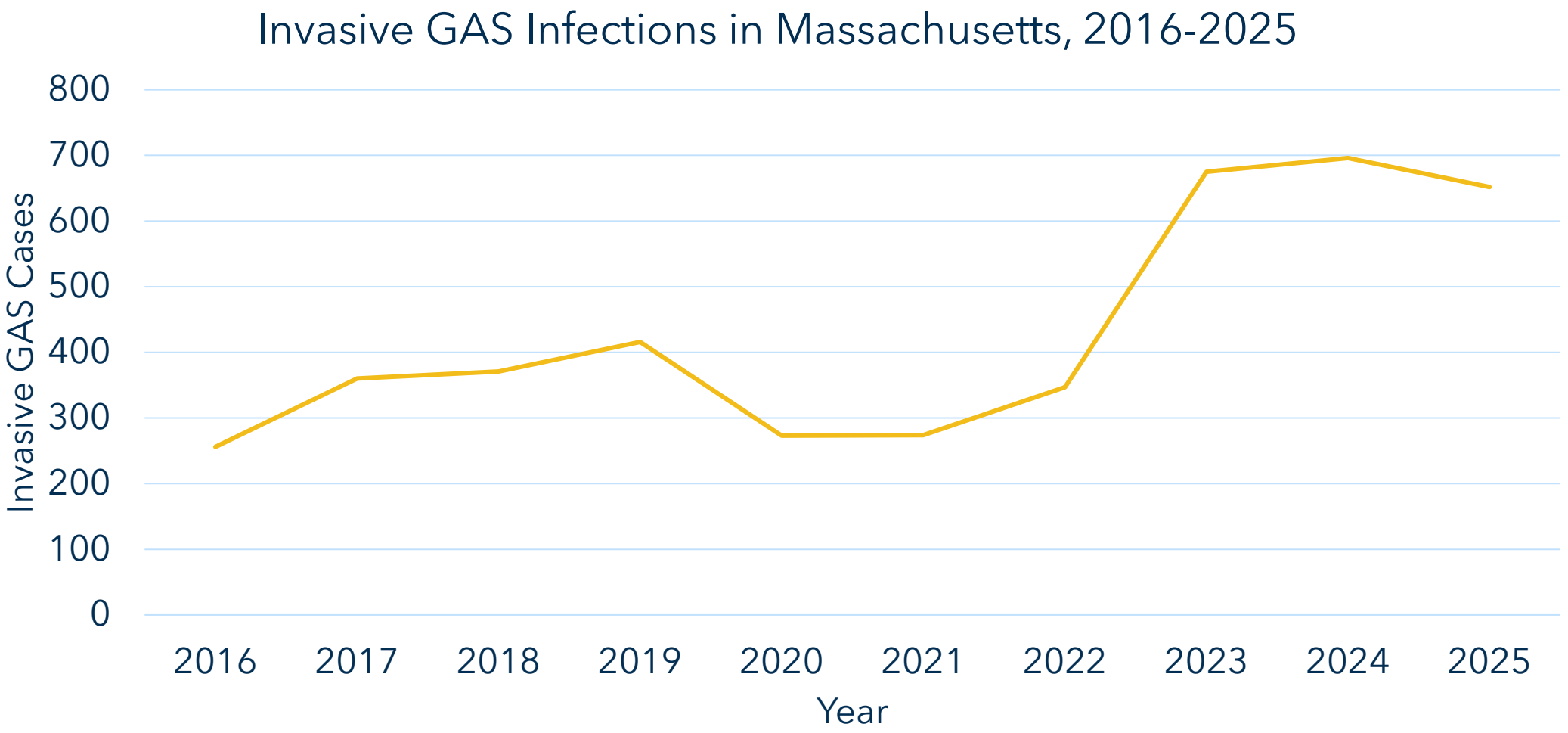


*Race and age-specific rates of disease and deaths were applied from the aggregate surveillance area to the age and racial distribution of the United States population for a given year.

Rates of GAS have been increasing since 2014, and infections reached a 20-year high in 2023.

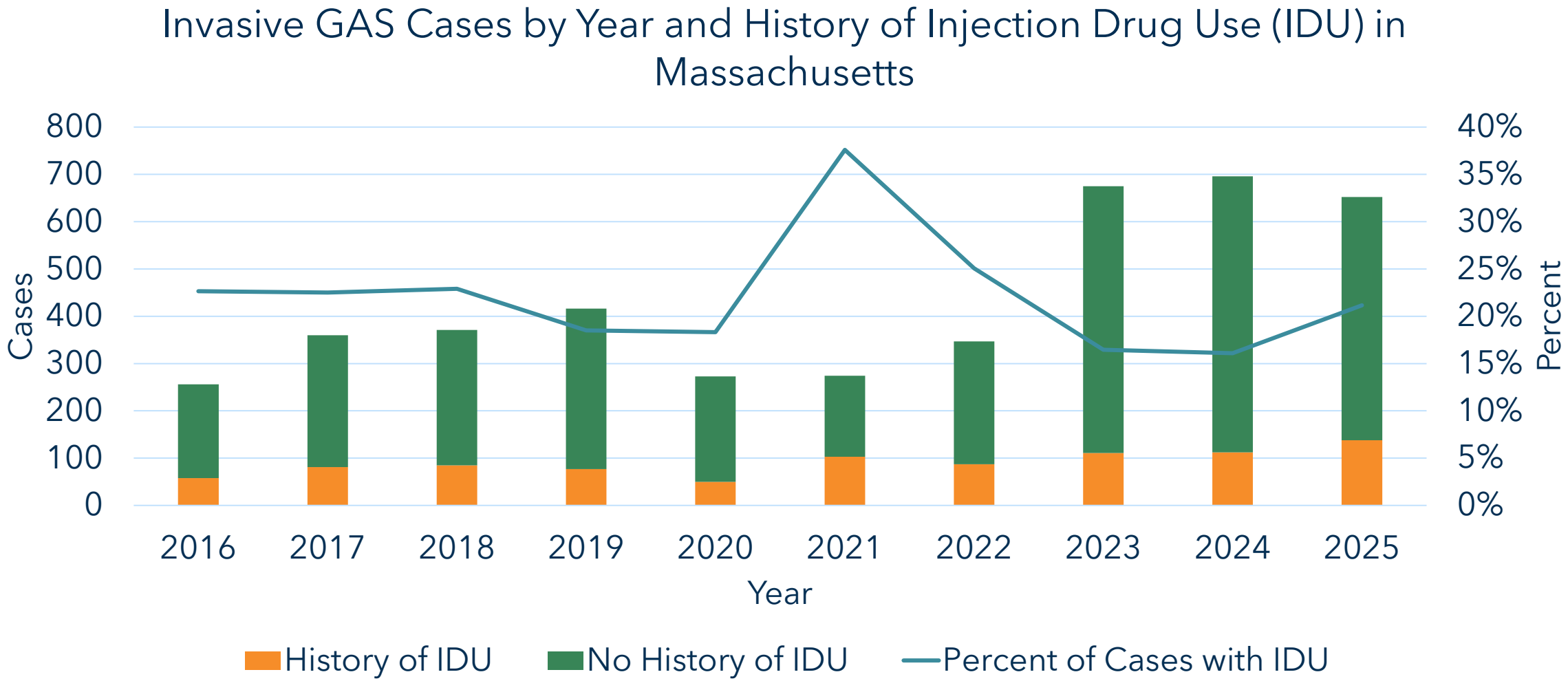
In 2023, there were 43,100 cases of invasive GAS and 4,210 deaths (9.8%).

Invasive GAS Infections in Massachusetts



Data are current as of February 26, 2026, and may be subject to change

Invasive GAS Infections in Massachusetts



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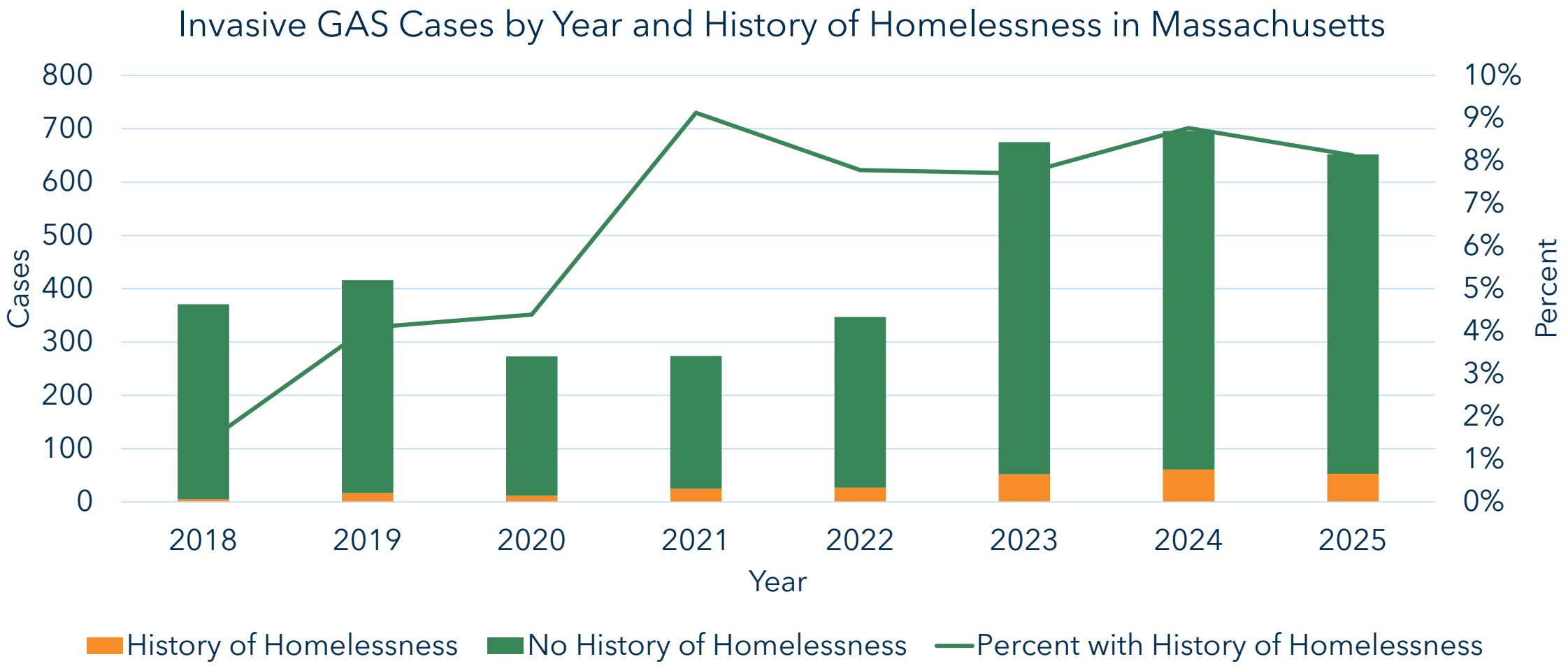
Invasive GAS Infections in Massachusetts



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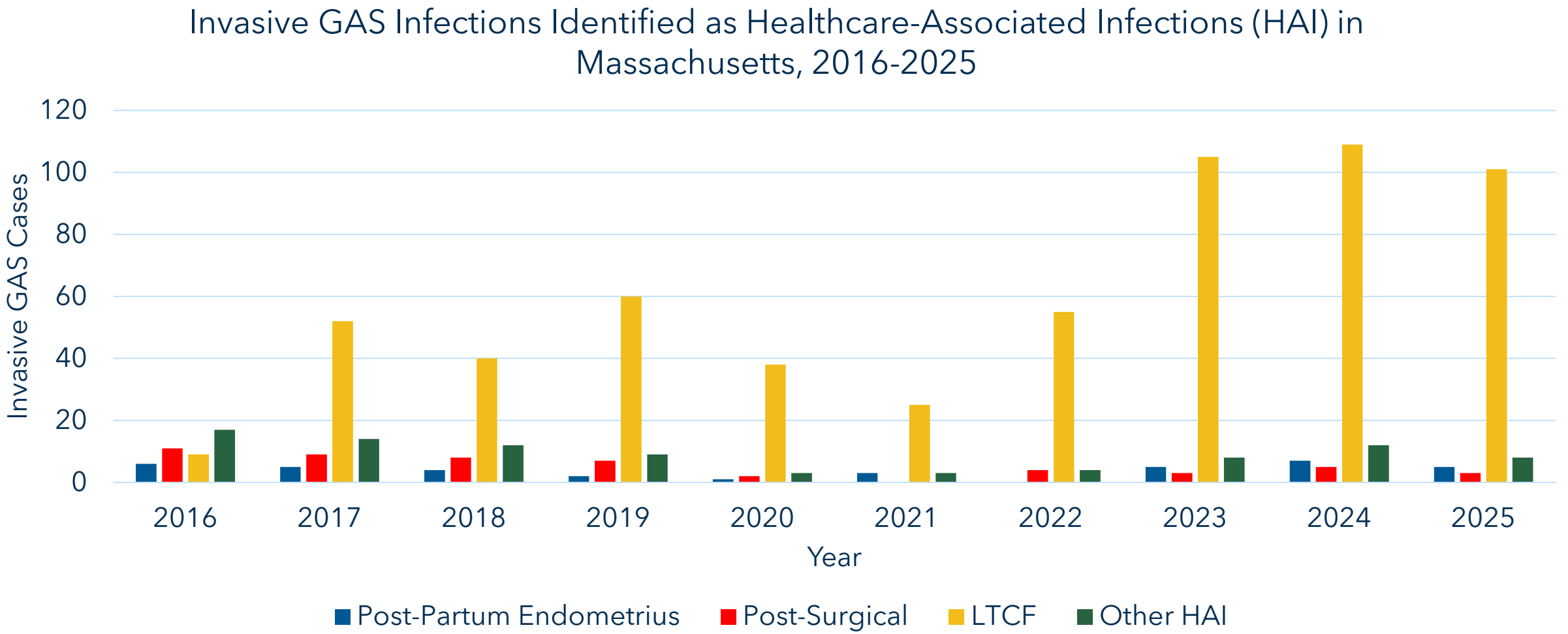
Healthcare-Associated GAS Infections in Massachusetts



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GAS Case Investigation

Initial Steps of GAS Investigations

All suspect invasive GAS infections are reported via electronic laboratory reporting (ELR) to MAVEN or by phone.

DPH Epis preliminarily review all GAS MAVEN events to determine if they meet one of the following criteria & trigger LBOH follow-up:

1. GAS isolated from a sterile site (e.g., blood, joint fluid, CSF)
2. GAS isolated from a wound in at least one of the following scenarios:
   a) Necrotizing fasciitis is noted,
   b) A patient during the post-partum period,
   c) A patient within 7 days of surgery, OR
3. Toxic shock syndrome with GAS cultures from ANY site

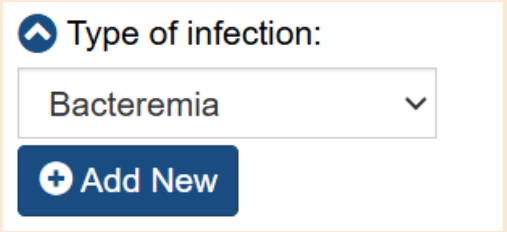
LBOH Notification:
Only after the DPH Epi confirms the GAS event meets this criteria will it show up in a LBOH Immediate Notification Workflow for LBOH investigation.

*Non-invasive infections (e.g., pharyngitis and skin infections) are NOT reportable.

Examples of Sterile and Nonsterile Sites

Specimen Source	Sterile?
Peritoneal Fluid	Yes
Abscess	Maybe
Ascites	Yes
Bile	No
Blood	Yes
Bronchial aspirate	No
Cerebrospinal fluid	Yes
Cyst	Maybe
Joint fluid	Yes
Oropharynx	No
Pleural fluid	Yes
Sputum	No
Synovial fluid	Yes
Wound	No

LBOH HINT: Specimen Sources are reviewed by DPH Epis prior to LBOH assignment. The specimen source can be used to complete the "Type of Infection" question in the Clinical question package and is repeatable:



Blood specimen = Bacteremia
Joint/Synovial fluid = Septic arthritis
*Some may require additional investigation, such as Abscess

Case Notification for LBOH

- The assigned DPH epidemiologist reviews and confirms the case if it meets criteria.
  - If the specimen source is not a sterile site or a surgical/post-partum wound, the case is Revoked.
- Once the case is confirmed by the assigned DPH epidemiologist, it will go into the **LBOH Immediate Notification workflow**.
  - Please note, the event will not appear in local workflows for follow-up until the case classification is changed to "Confirmed" by the DPH Epi.
- LBOH conducts initial investigation/data collection and notifies assigned DPH Epi immediately if case is determined to be Healthcare Associated so DPH HAI team can conduct further follow-up.

LBOH Role for Routine GAS Investigations

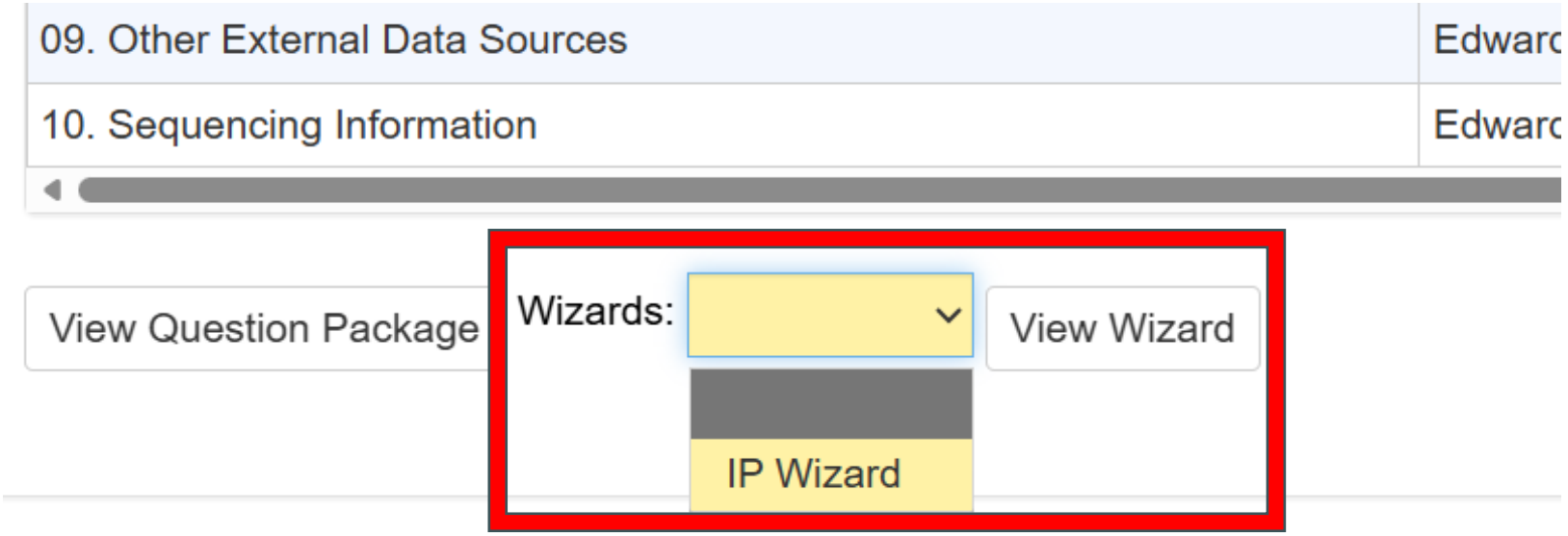
- Information should be collected from the ordering provider or hospital infection preventionist (IP). There is no need to contact the patient.
- Conduct the routine GAS investigation and reach out to the DPH epidemiologist if the case is healthcare-associated.
- Routine GAS investigation should be completed within 48 hours.
  - If the LBOH is unable to initiate the investigation within 24 hours, please reach out to the assigned DPH epi to request assistance.

MAVEN IP Module

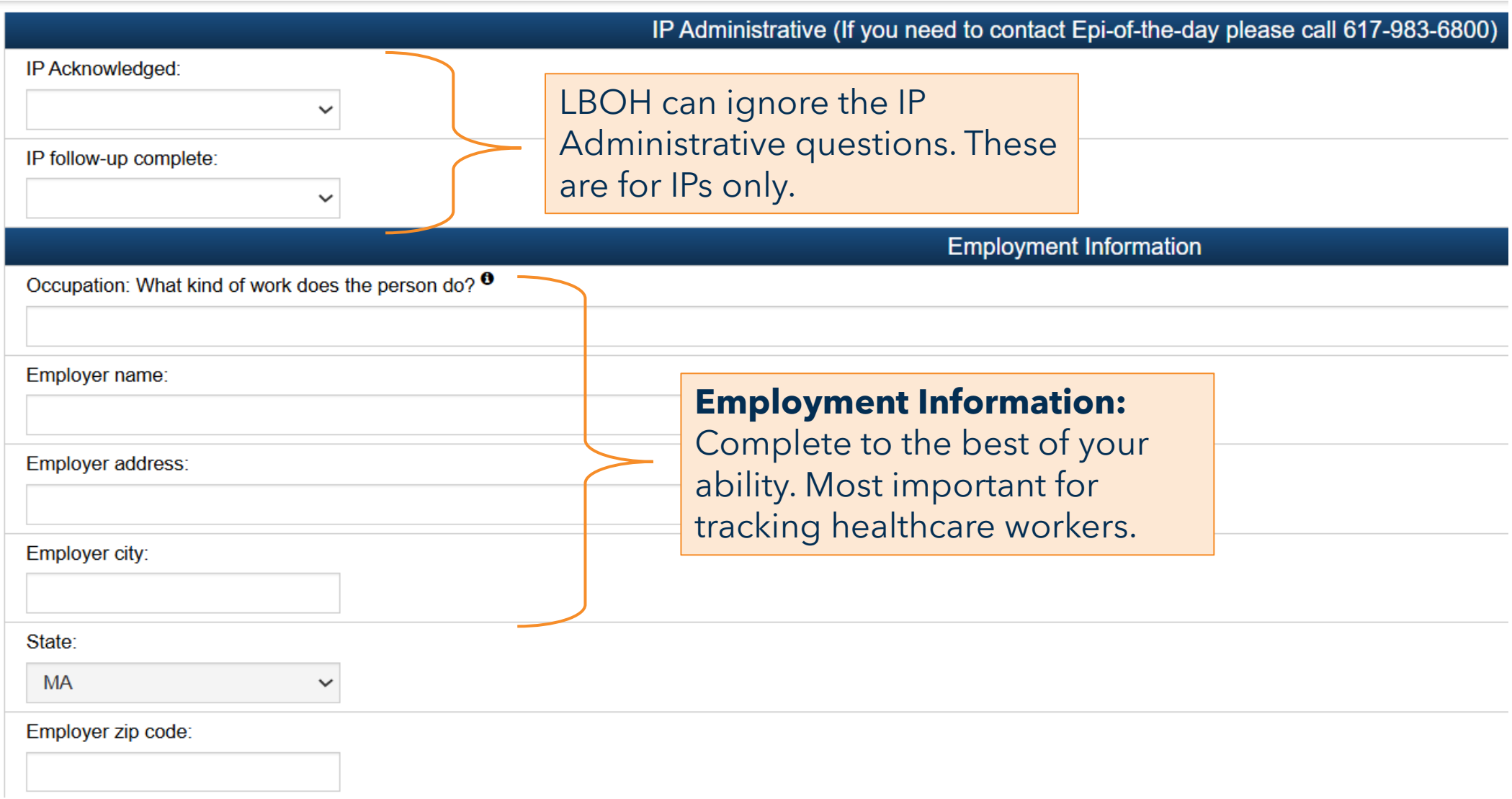
- Some IPs have access to MAVEN.
  - Healthcare facilities that are currently participating can be found here.
  - Only the assigned DPH Epi can share the case with the IPs. The DPH Epi will leave the LBOH a note indicating that the event has been sent to the hospital IP and additional LBOH follow-up will be determined once the case information is completed by the IP.
  - IPs can document case information directly in MAVEN using the IP wizard.
  - LBOH should allow 48 hours for the IP to enter information into MAVEN.
- If the IP does not have access to MAVEN, the LBOH should call the hospital IP directly.
  - There is a list of IP phone numbers in MAVEN Help.

Routine GAS Investigation

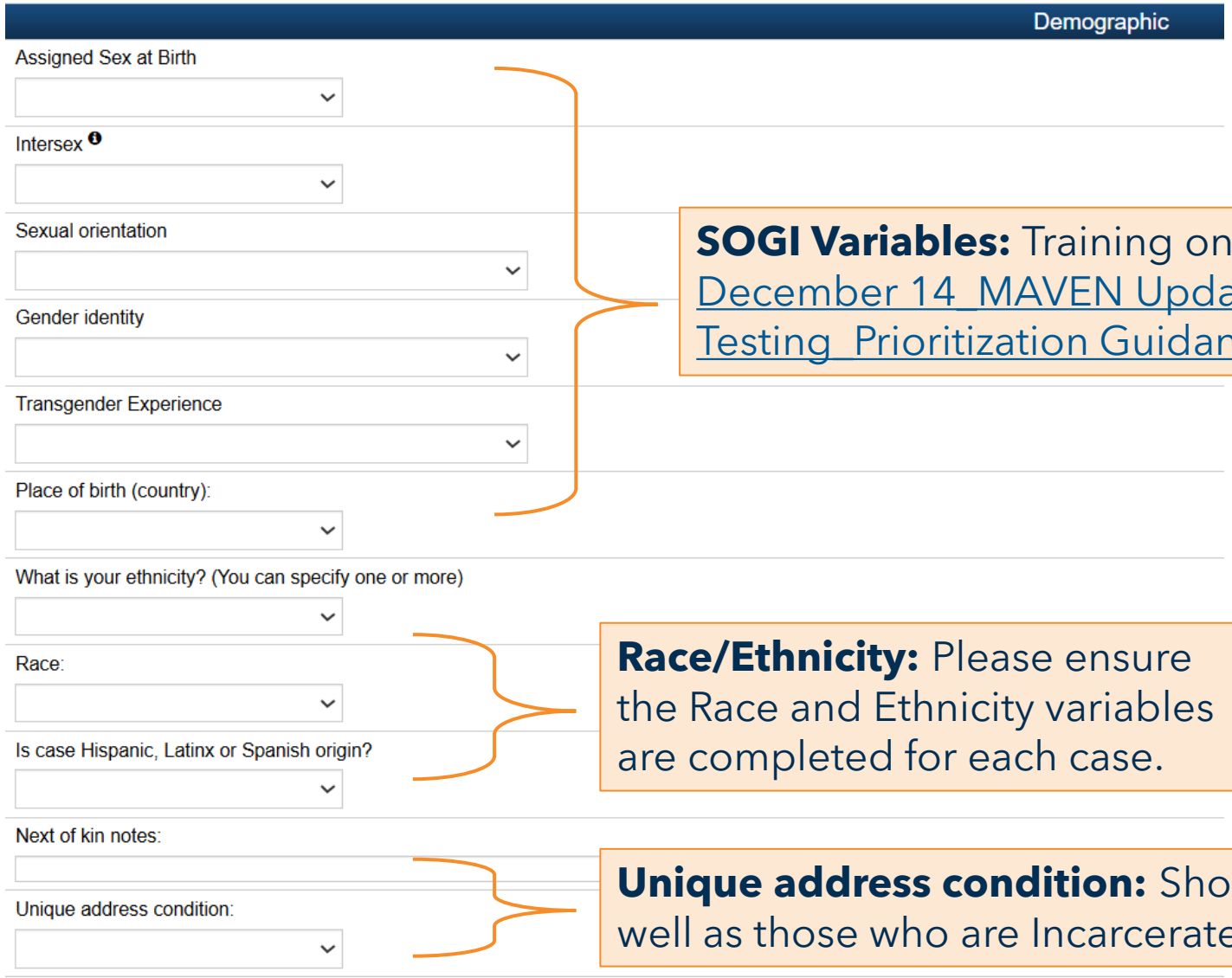
- LBOH conducting the investigation should ensure that relevant demographic, clinical, and risk question packages are completed in MAVEN. (Please utilize the IP wizard!)



Using the Wizard



Using the Wizard – Demographic Questions

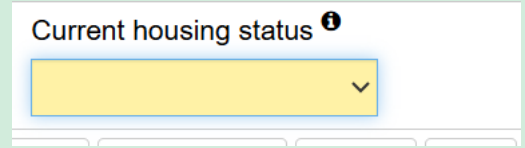


SOGI Variables: Training on SOGI Variables found here: December 14_MAVEN Updates_SOGI Presentation_Self Testing_Prioritization Guidance for LBOH

Race/Ethnicity: Please ensure the Race and Ethnicity variables are completed for each case.

****Variable not in Wizard *yet*****

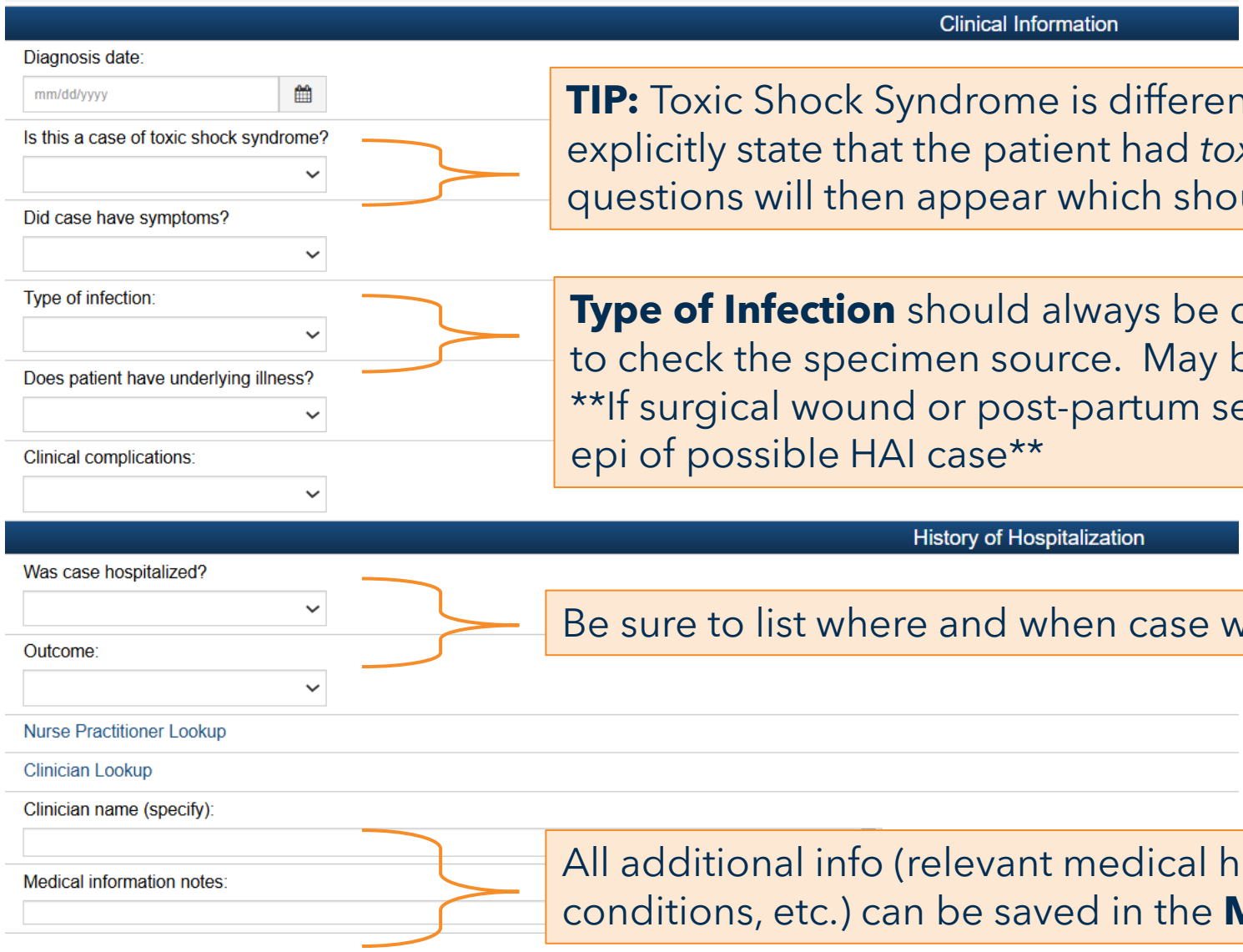
Please go into Demographic QP to complete:



If case is homeless, please describe in MAVEN Notes

Unique address condition: Should be used to record Homeless status, as well as those who are Incarcerated or reside in Long Term Care.

Using the Wizard – Clinical Questions



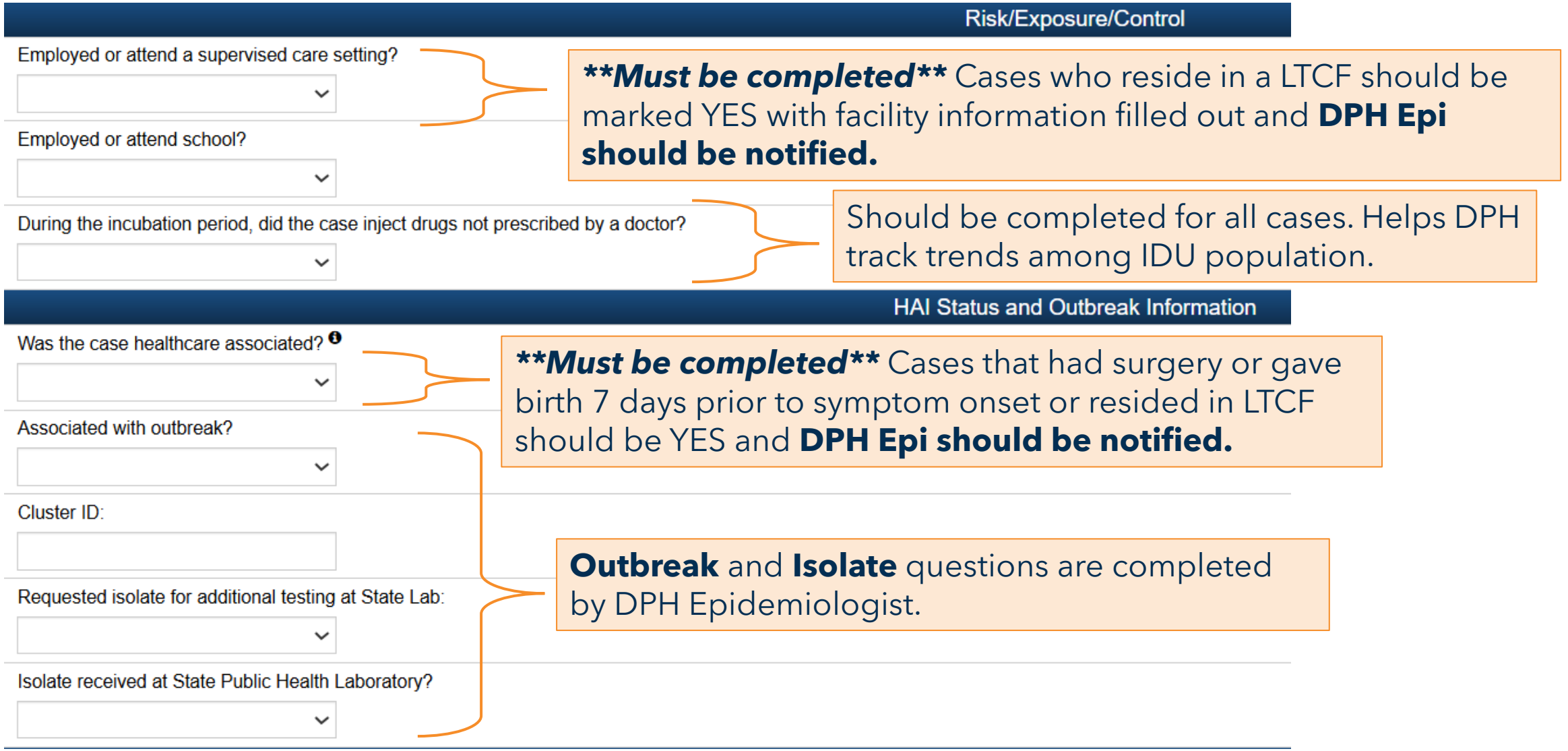
TIP: Toxic Shock Syndrome is different from just "shock". The provider must explicitly state that the patient had *toxic shock* for this to be YES. Child questions will then appear which should be answered. These are rare events.

Type of Infection should always be completed. Remember to check the specimen source. May be more than one Type. **If surgical wound or post-partum sepsis, be sure to notify epi of possible HAI case**

Be sure to list where and when case was **hospitalized**

All additional info (relevant medical history, additional underlying conditions, etc.) can be saved in the **Medical Information Notes.**

Using the Wizard – Risk and HAI Questions



Must be completed Cases who reside in a LTCF should be marked YES with facility information filled out and **DPH Epi should be notified.**

Should be completed for all cases. Helps DPH track trends among IDU population.

Must be completed Cases that had surgery or gave birth 7 days prior to symptom onset or resided in LTCF should be YES and **DPH Epi should be notified.**

Outbreak and **Isolate** questions are completed by DPH Epidemiologist.

Healthcare Associated Infections (HAI) and GAS

LBOH Investigations Play a Critical Role

- LBOH play a critical role in helping to identify Healthcare-Associated Infections among GAS investigations, triggering further DPH actions.
  - Timely data collection & reporting by LBOH in MAVEN helps rule in/out HAI situations.
  - **Time Sensitive:** If a MAVEN GAS event is determined to be HAI, DPH must act quickly to request lab specimens before they are discarded and to follow up on potential healthcare settings to implement control measures and prevent further spread.

DPH Requests GAS Isolates – Speed is Key!

- The **DPH Epidemiologist** will request isolates from all cases that may be post-partum, post-surgical, or associated with any type of healthcare facility (including LTCF) within 2-3 days of case notification.
  - Laboratories typically discard samples within 5-7 days of the final culture result.
  - **Timely notification to DPH Epi of HAI cases** will increase chances of successfully obtaining these isolates
- The MA State Public Health Laboratory (MA SPHL) conducts whole genome sequencing (WGS) testing on all isolates submitted.

Reviewing the Exposure Period to Determine HAI

- A 7-day exposure period is used to determine if a GAS case is healthcare-associated.
- **In the 7 days prior to symptom onset**, did the case:
  - Reside in a long-term care facility?
  - Have a surgical procedure?
  - Give birth?
  - Spend time inpatient at a healthcare facility?

<u>If YES</u>: IMMEDIATELY NOTIFY DPH Epi so further action can be taken by DPH HAI Epi Team.

Be sure to document in the Notes the date, type and location of healthcare exposure.

EXAMPLE: Case is considered healthcare-associated because they were inpatient at a hospital within the 7 days prior to symptom onset.

Admission	(Day -7)	(Day -6)	(Day -5)	(Day -4)	(Day -3)	**Discharge** (Day -2)	(Day -1)	**Symptom Onset** (Day 0)	

Investigations for Healthcare Associated GAS Cases

- **Following LBOH Case Completion: Only invasive GAS infections that are healthcare-associated need to be investigated further by DPH.**
  - If the LBOH determines that a GAS infection is HAI, contact the assigned DPH Epi in the initial case note for assistance.
- The DPH HAI Epi Team leads case/cluster investigations that are healthcare-associated. LBOHs are not responsible for HAI follow-up.
- For clusters/outbreak situations we want to prevent further transmission and identify and eliminate a reservoir if it exists (i.e., eliminating carriage).
- HCW can shed bacteria through the respiratory tract, anally or vaginally.
  - This can occur in both symptomatic HCWs (i.e., strep throat infections, wounds) or in colonized HCWs. Colonized HCWs can unintentionally spread bacteria. Screening of HCWs may be recommended.

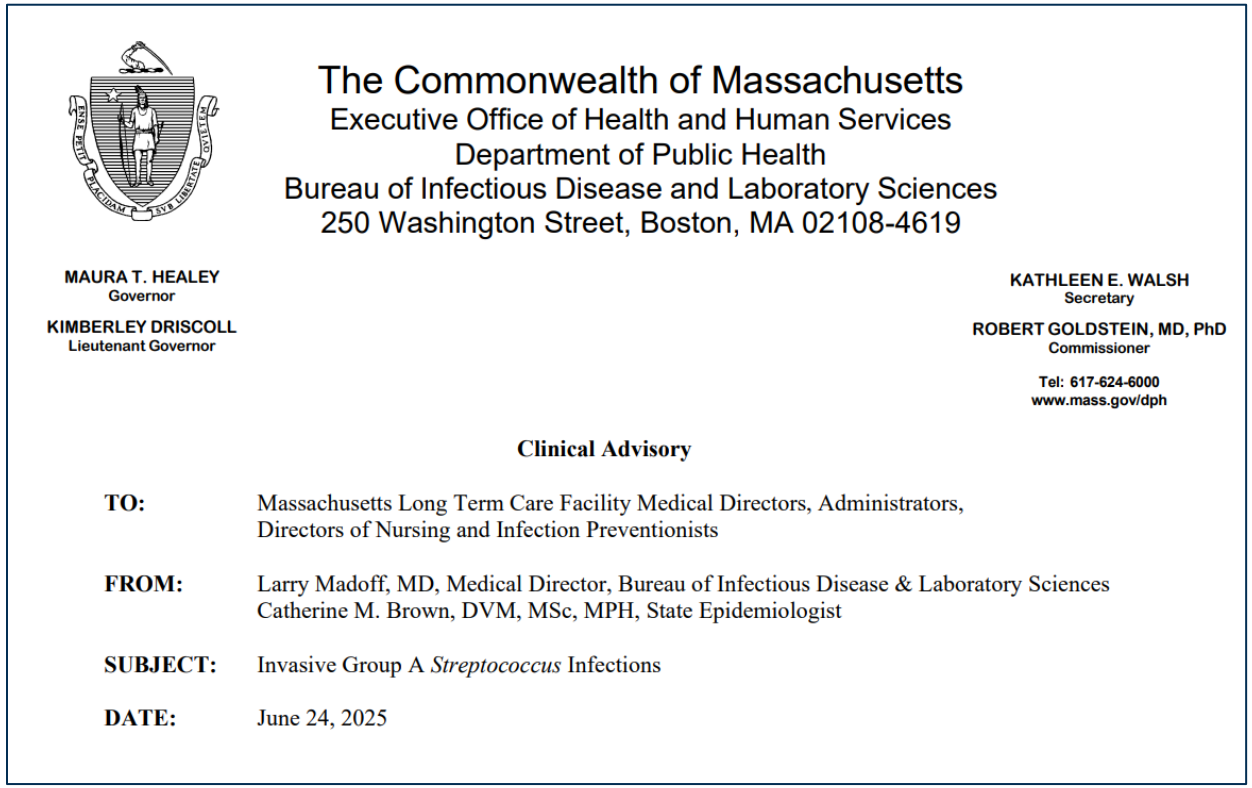
DPH Recommendations for Healthcare-associated GAS Infections

- DPH recommendations for healthcare-associated cases may include but are not limited to:

Retrospective and prospective surveillance for resident and staff cases for 6 months (invasive or non-invasive)	Symptomatic resident/staff testing	Appropriate treatment and 24-hour contact precautions for positive case(s)	Ensure proper hand hygiene (HH), cleaning and disinfection, and wound care
WGS of positive specimen (whole genome sequencing)	Audit wound care practices, if applicable	Audit HH and ensure ABHS use/availability	Audit cleaning and disinfection of the environment and shared medical equipment

GAS Clusters in LTCF

- When two or more cases of GAS in a LTCF are found to be highly-related through WGS, intensive follow up is led by DPH epidemiologists.
- Recommendations outlined in 2025 Clinical Advisory for LTCF.



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Clinical Advisory

TO: Massachusetts Long Term Care Facility Medical Directors, Administrators, Directors of Nursing and Infection Preventionists

FROM: Larry Madoff, MD, Medical Director, Bureau of Infectious Disease & Laboratory Sciences
Catherine M. Brown, DVM, MSc, MPH, State Epidemiologist

SUBJECT: Invasive Group A *Streptococcus* Infections

DATE: June 24, 2025

Review: LBOH Role in GAS Investigations

- Initiate investigation of confirmed cases within 48 hours
  - Reach out to epidemiologist if unable to initiate investigation
- Contact ordering provider/IP to collect information
- Complete all MAVEN question packages (Demographic, Clinical, Risk/Exposure, Epi-linked/Outbreak)
  - Hint: Use the IP Wizard
- Determine if a case is healthcare-associated (i.e., lives in LTCF, or is within 7 days of discharge following surgery or childbirth)
- For healthcare-associated cases, the LBOH is not expected to lead follow up. Contact the DPH epidemiologist to have them follow-up.

Group A Strep (GAS) Case Investigations – Summary

Pre-LBOH Investigation

Electronic lab report (ELR) to MAVEN generates GAS Event.

DPH Epi Reviews GAS Event criteria & CONFIRMS or REVOKES.

LBOH Investigation

CONFIRMED GAS Events appear in **LBOH Immediate Notification Workflow** for LBOH Investigation.

LBOH completes MAVEN investigation (IP Wizard Variables).

Some **IPs** have access to MAVEN and may complete the IP Wizard directly. Otherwise, **LBOH** should call IP for information.

LBOH reviews/completes MAVEN investigation & notifies **DPH Epi** if determined to be Healthcare Associated* ***(*Time Sensitive).***

Post-LBOH Investigation

DPH Epi reviews case.

If applicable, **DPH Epi** notifies **Healthcare Associated Infections (HAI) Epi Team** & requests specimen isolate.

HAI Epi Team conducts additional healthcare investigation as needed.

GAS Resources

- CDC GAS Disease: https://www.cdc.gov/group-a-strep/index.html
- DPH GAS Fact Sheet: https://www.mass.gov/info-details/group-a-streptococcal-disease
- DPH LTCF Memo: LTCF GAS Clinical Advisory_June 2025.pdf
- Tip Sheet for LBOH (MAVEN Help): Group A Strep (GAS) Tip Sheet for LBOH.pdf
- American Academy of Pediatrics, [Group A Streptococcal Infections] Kimberlin DW, Brady MT, Jackson MA, Long SS, eds. Red Book: 2018 Report of the Committee on Infectious Diseases, 31st ed, Itasca, IL: American Academy of Pediatrics; 2018:748-762.
- Heymann, D., Ed., Control of Communicable Diseases Manual, American Public Health Association, 20th ed, 2015:581-591.
- The Prevention of Invasive Group A Streptococcal Infections Workshop Participants, Prevention of Invasive Group A Streptococcal Disease among Household Contacts of Case Patients and among Postpartum and Postsurgical Patients: Recommendations from the Centers for Disease Control and Prevention, CID, 2002; 35:950-9.
- CDC audit tool: https://www.cdc.gov/infectioncontrol/pdf/icar/ltcf.pdf

Questions?