



St. Mary's
GENERAL HOSPITAL

MAIN

ENTRANCE

Group A *Streptococcus* spp.

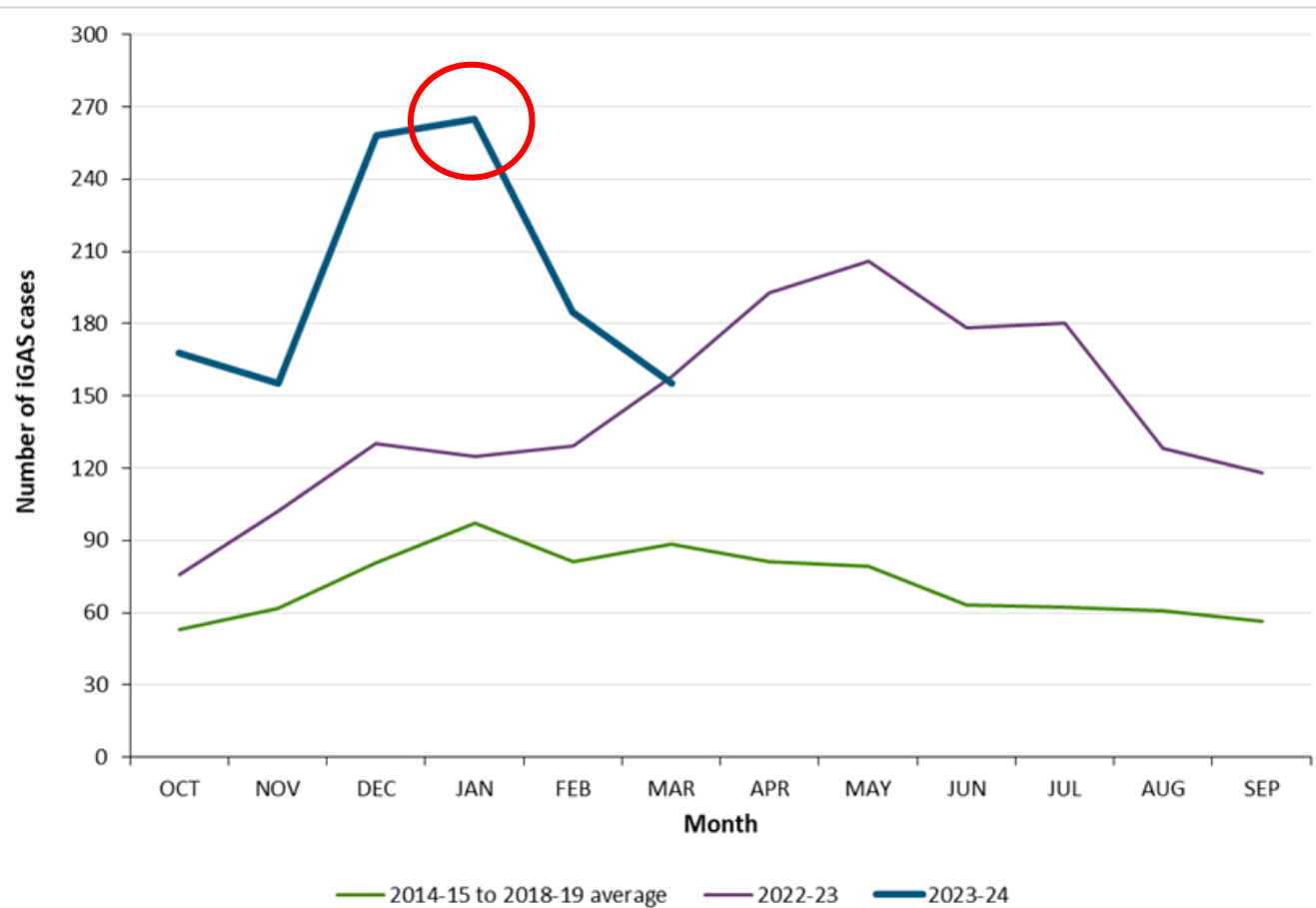
A disease with many faces

Dr. Kevin Stinson, PhD CIC RMCCM



St. Mary's
GENERAL HOSPITAL

The January 2024 Experience

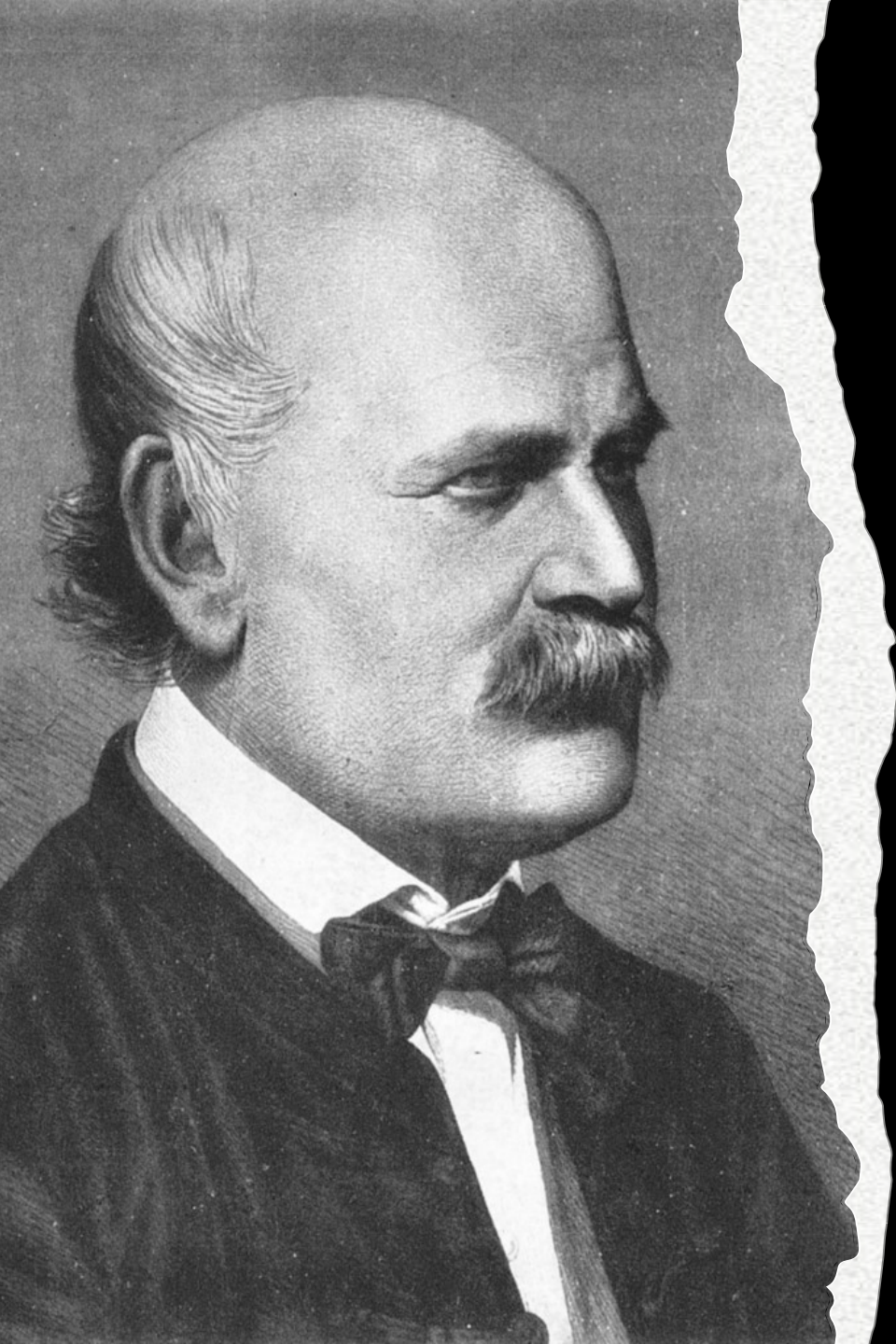


Source: PHO iGAS Surveillance Report





Hôtel Dieu – Paris



**Dr. Ignaz
Semmelweis**

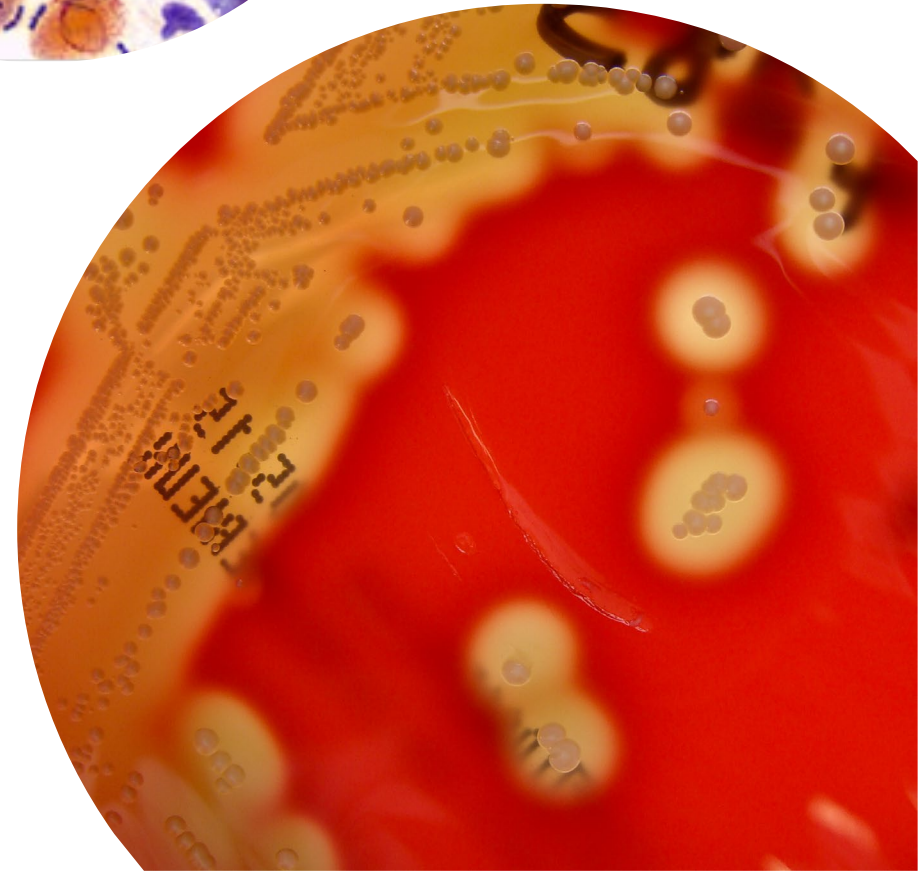
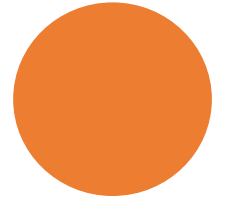
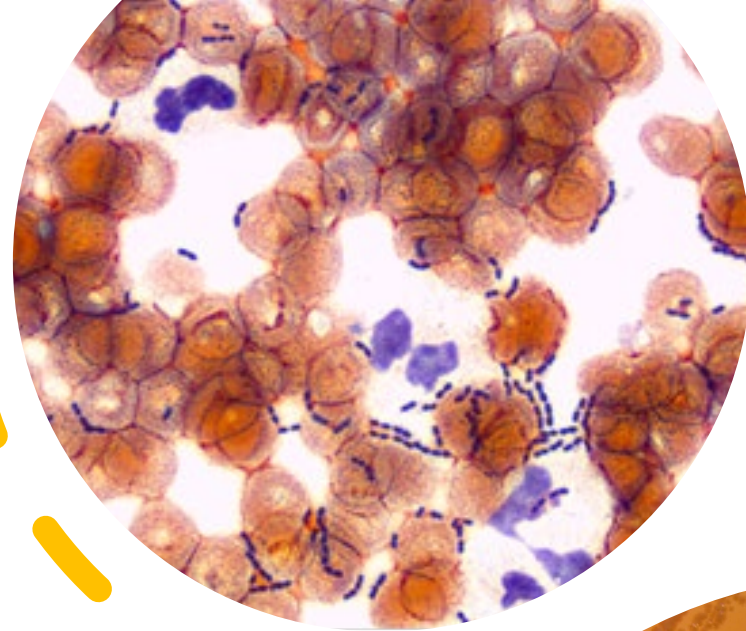


World War I

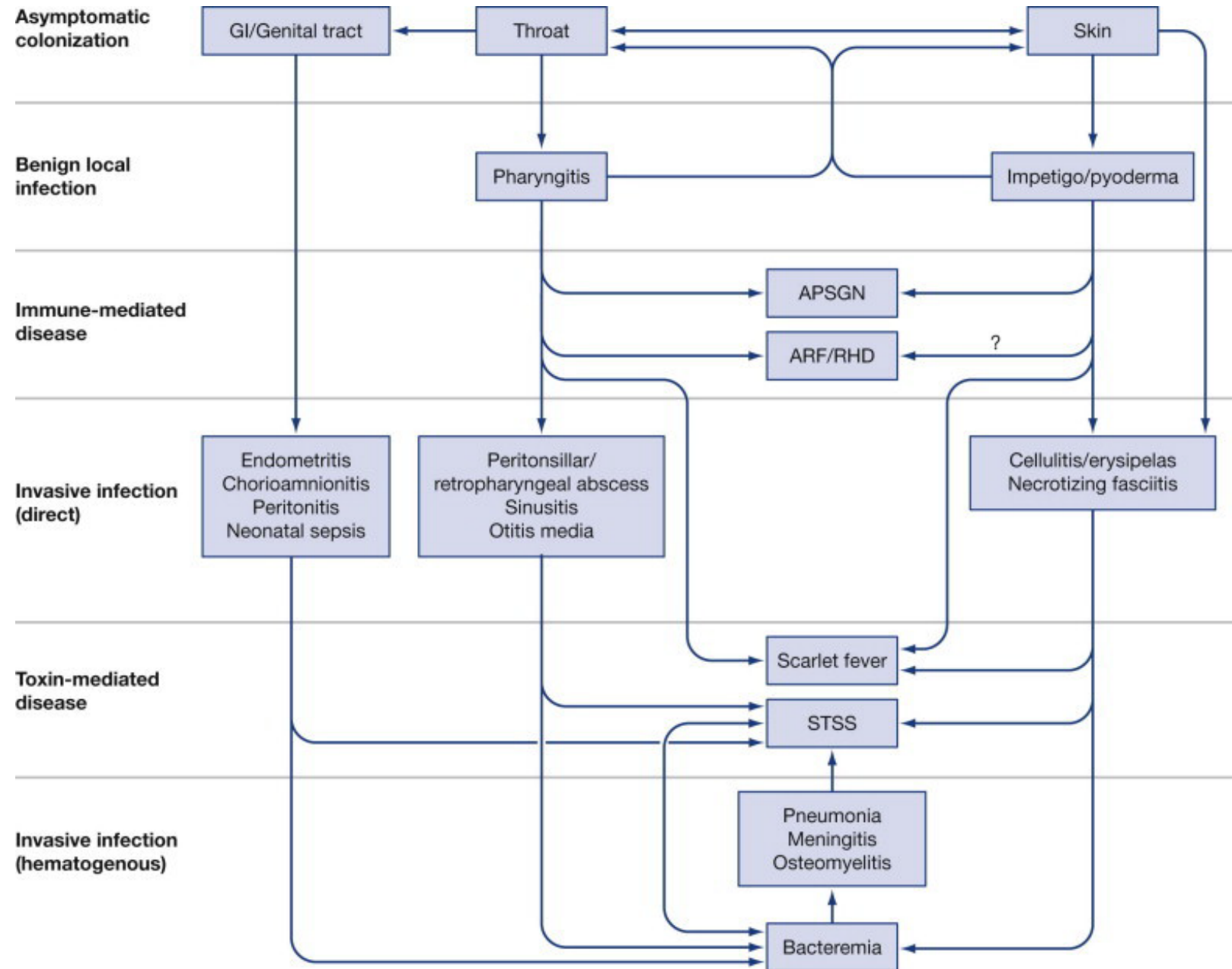
Why is GAS such an effective pathogen?

What is GAS?

- *Streptococcus pyogenes* – Gram-positive beta-haemolytic cocci
- Remains a top-10 ID cause or mortality on a global front
- Colonization rates: 5% healthy adults; 20-60% school-aged children; >25% adults with household exposure

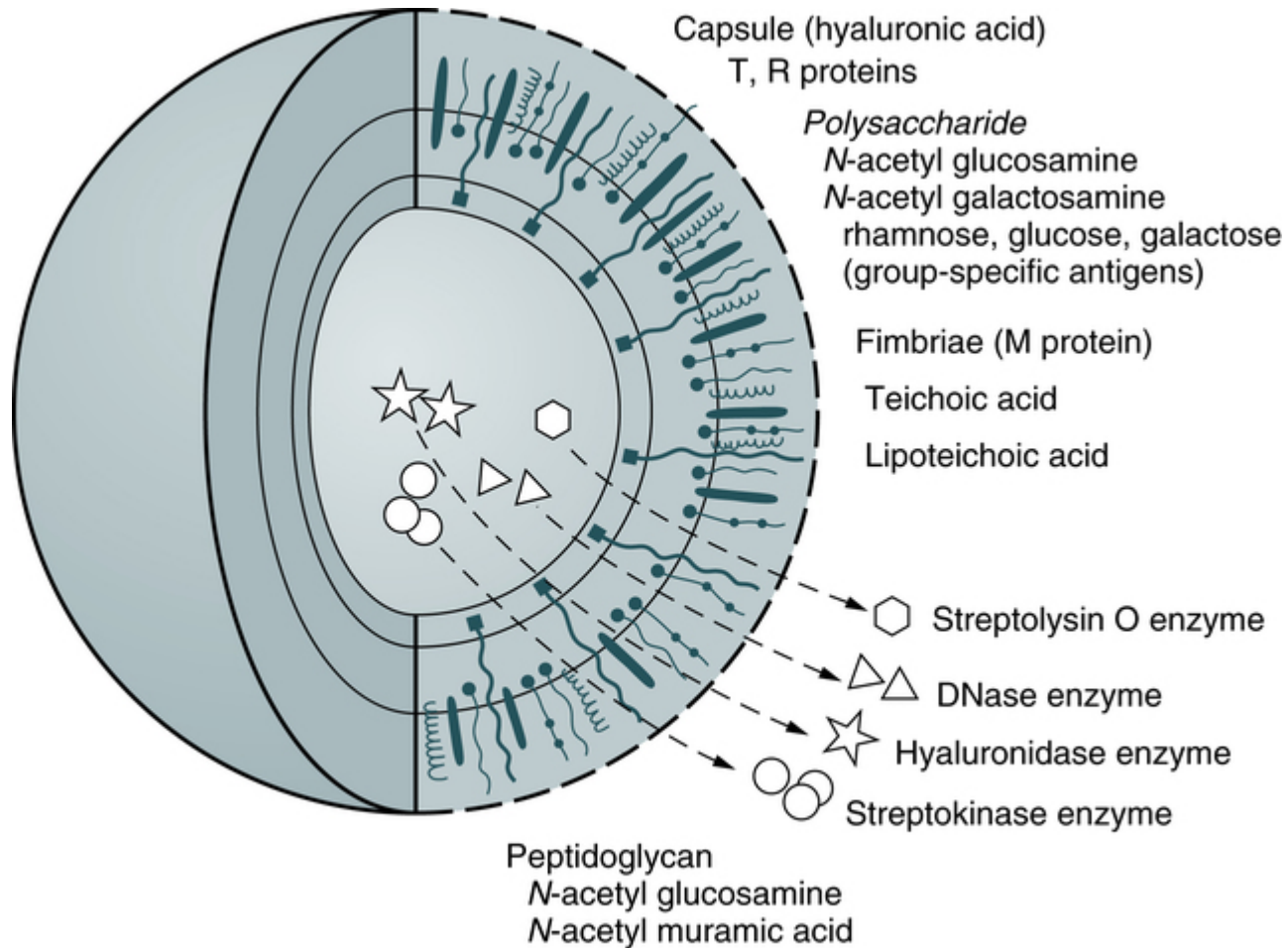


Range of colonization and illness



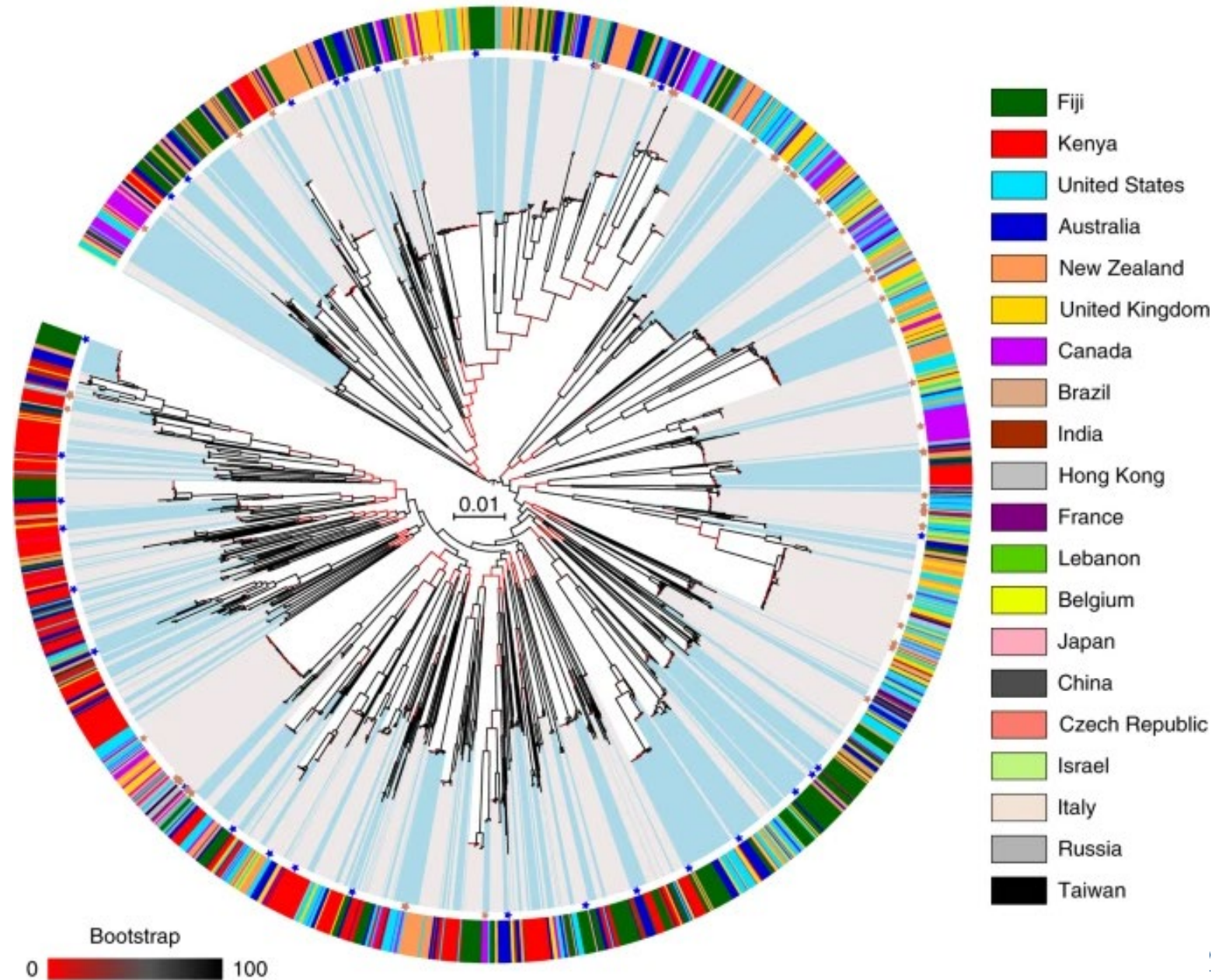


Virulence factors



- M Protein (*emm* gene)
- Hyaluronic Acid Capsule
- Secreted Enzymes
- Superantigens/exotoxins

Antigenic Diversity



Why have we seen a surge of iGAS?

**Caution:
Speculation
Ahead!**



Is this a hypervirulent strain?

Most commonly reported <i>emm</i> type by rank	Current season: ≥ 18 years of age (October 1, 2023 – March 31, 2024)	Previous season: ≥ 18 years of age (October 1, 2022 – March 31, 2023)	Current season: < 18 years of age (October 1, 2023 – March 31, 2024)	Previous season: < 18 years of age (October 1, 2022 – March 31, 2023)
<i>emm</i> 1	213 (34.4%)	37 (7.7%)	68 (71.6%)	24 (40.7%)
<i>emm</i> 80	38 (6.1%)	40 (8.3%)	0 (0.0%)	0 (0.0%)
<i>emm</i> 12	37 (6.0%)	55 (11.4%)	9 (9.5%)	23 (39.0%)
<i>emm</i> 82	33 (5.3%)	58 (12.0%)	0 (0.0%)	0 (0.0%)
<i>emm</i> 59	32 (5.2%)	7 (1.4%)	0 (0.0%)	0 (0.0%)
<i>emm</i> 74	31 (5.0%)	22 (4.6%)	0 (0.0%)	0 (0.0%)
<i>emm</i> 49	28 (4.5%)	67 (13.9%)	1 (1.1%)	3 (5.1%)
<i>emm</i> 41	27 (4.4%)	15 (3.1%)	0 (0.0%)	1 (1.7%)
<i>emm</i> 92	23 (3.7%)	14 (2.9%)	0 (0.0%)	0 (0.0%)
<i>emm</i> 2	22 (3.5%)	5 (1.0%)	4 (4.2%)	2 (3.4%)
<i>emm</i> 76	16 (2.6%)	10 (2.1%)	0 (0.0%)	1 (1.7%)
<i>emm</i> 28	14 (2.3%)	11 (2.3%)	1 (1.1%)	2 (3.4%)
Other	106 (17.1%)	142 (29.4%)	12 (12.6%)	3 (5.1%)
Total with <i>emm</i> type	620 (60.0%)	483 (75.5%)	95 (63.3%)	59 (73.8%)
Total without <i>emm</i> type	413 (40.0%)	157 (24.5%)	55 (36.7%)	21 (26.3%)
Total	1,033 (100.0%)	640 (100.0%)	150 (100.0%)	80 (100.0%)

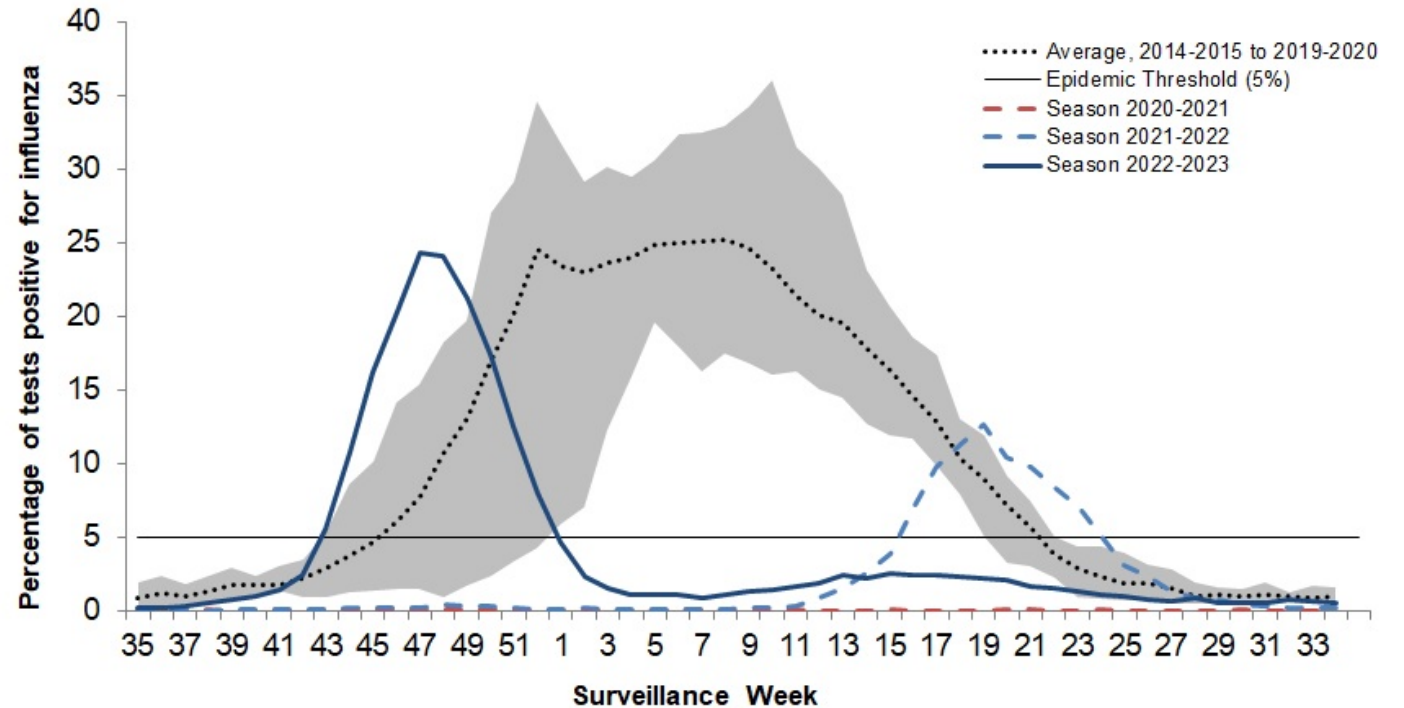
Data source: iPHIS

* Cases with an unknown age are excluded from this table.

**For the previous season, only data for confirmed iGAS cases reported October 1, 2022 – March 31, 2023 are presented for comparability to the current iGAS season.

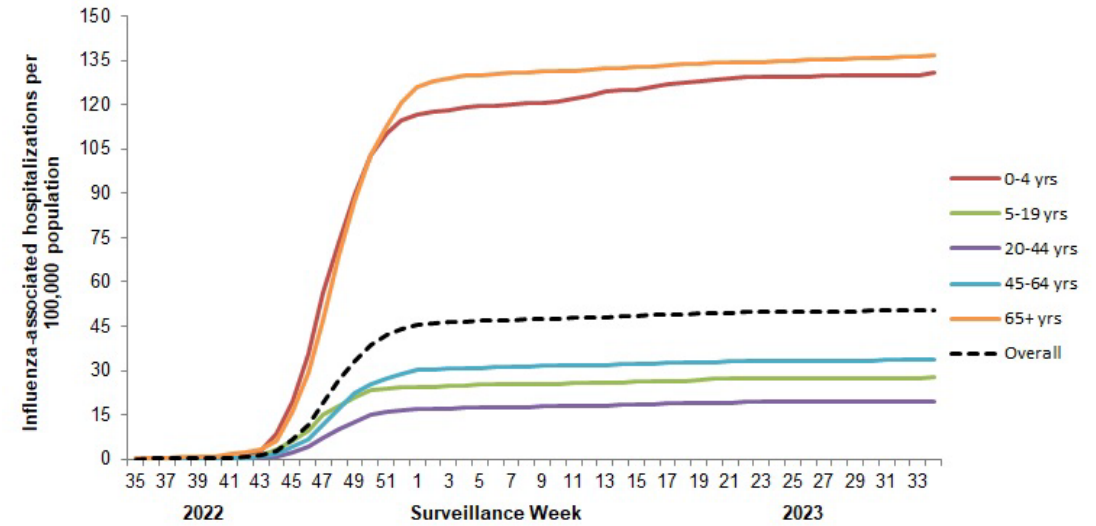
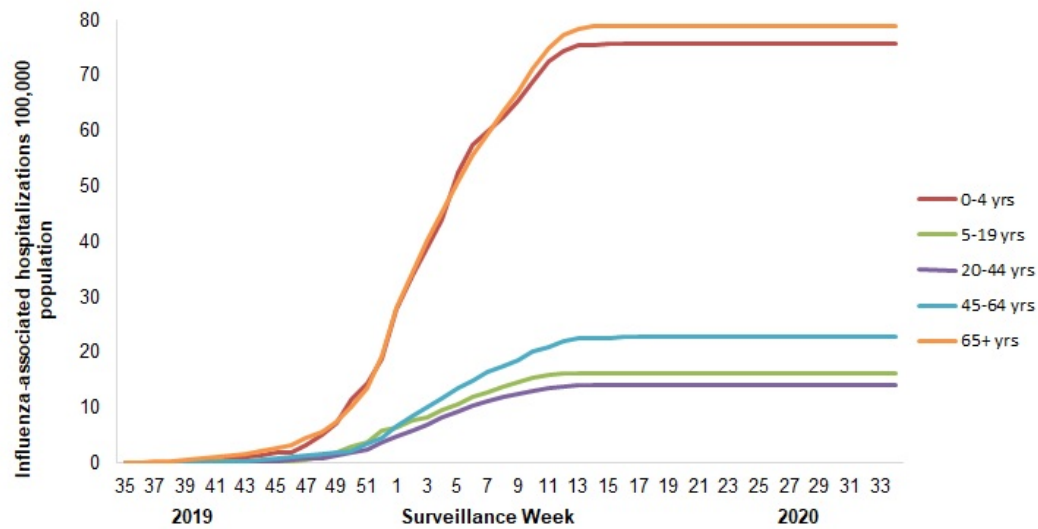
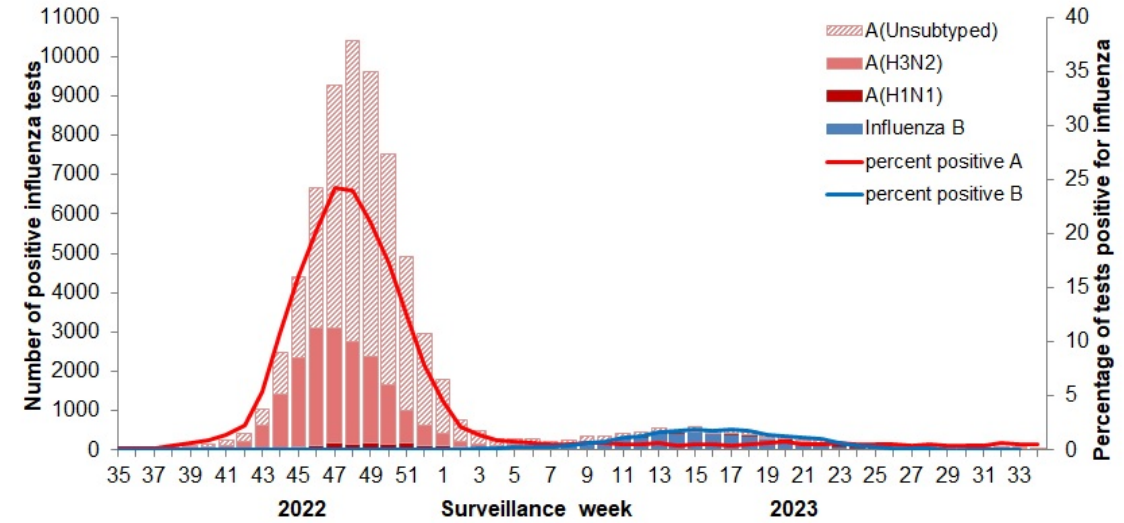
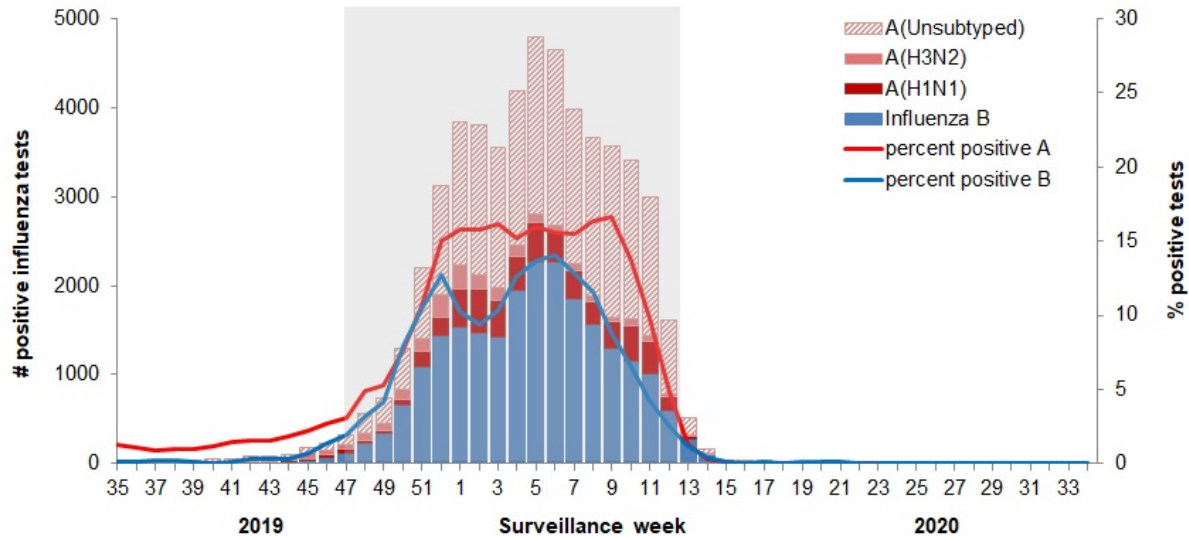
Source: PHO iGAS Surveillance Report

Loss of mucosal immunity?



Source: FluWatch 2022/2023 Season

FluWatch: 2019 versus 2022



Possible mechanisms

Waning IgA at mucosal surfaces allow for more efficient GAS adherence and colonization

Increased frequency and duration of viral illness increases secretions and impairs GAS clearance

Immune suppression due to repeat viral illness increases risk of secondary infection

IPAC Management of iGAS

Definition of iGAS

- GAS identified from a normally sterile site (Blood, CSF, Joint, etc.)

OR

- GAS identified from a non-sterile site with evidence of severity
 - STSS with multi-organ dysfunction
 - Soft-tissue necrosis
 - Meningitis
 - Death

IPAC Precautions

Droplet Contact Precautions

Discontinue precautions
after 24 hours of effective
antimicrobial therapy



References

History of GAS

- Demon under the Microscope, Thomas Hager

GAS Epidemiology

- doi.org/10.1038/s41579-023-00865-7
- doi.org/10.1097/INF.00000000000004111
- doi.org/10.1017/S0950268818002285
- doi.org/10.1128/jcm.00301-15
- doi.org/10.1186/1471-2180-8-59
- [doi.org/10.1016/S1473-3099\(09\)70178-1](https://doi.org/10.1016/S1473-3099(09)70178-1)

GAS Pathobiology

- doi.org/10.1128/msphere.00806-19
- doi.org/10.1016/j.tim.2010.02.007
- doi.org/10.1038/s41541-022-00593-8
- doi.org/10.1038/s41588-019-0417-8
- doi.org/10.1111/irv.12658
- doi.org/10.3389/fmicb.2016.00342
- doi.org/10.1093/ofid/ofad188



Questions?

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