OP11 Learning from Out-breaks

Application of Microbiological Risk Assessment in a Norovirus Outbreak at a Buffet Restaurant—Taipei, Taiwan, January 2025

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Too Many Choices, Too Few Clues

Challenges of foodborne outbreak investigation in buffets

Outbreak in a Buffet Restaurant

Time

Jan 5–6, 2025

Scale

82 diners were reported ill after eating at a buffet restaurant in Taipei

Symptoms

Vomiting, diarrhea, abdominal pain

Preliminary Investigation

Preliminary investigation of 8 cases

- Average incubation period: **~24 hours**
- Main symptoms: **vomiting and diarrhea**

Epidemiologic context

Norovirus currently circulating in Taiwan

} Norovirus infection ?!

Next steps

Apply a **microbiological risk assessment** suited to norovirus to facilitate our **food investigation**

Microbiological Risk Assessment

Grouped by buffet station

Subgrouped by risk level for norovirus

- **High-risk items** (raw/non-reheated): seafood, sashimi, sushi, etc., → ask about each item individually
- **Low-risk items** (cooked/less perishable): grilled meat, fruit, desserts, etc., → ask about each group collectively

Categorized into 32 food groups drawn from over 200 food items for analysis

AI generated

Epidemiologic Study

Online questionnaire with photos

Case-control design

- Cases: diners eating at the restaurant on January 5 or 6 and developing symptoms **within 72 hours (≥3 episodes of diarrhea or any vomiting)**
- Controls: diners eating at the restaurant on January 5 or 6 with **no symptoms**
- Analysis: **univariate logistic regression** to identify significant items, which were then included in a **multivariate model**

AI generated

Epidemiologic and Laboratory Results

669 valid questionnaires

Response rate: 41.2 %

337 cases identified

Symptoms: **nausea** (87 %),

diarrhea (81 %), **vomiting** (75 %)

Median incubation

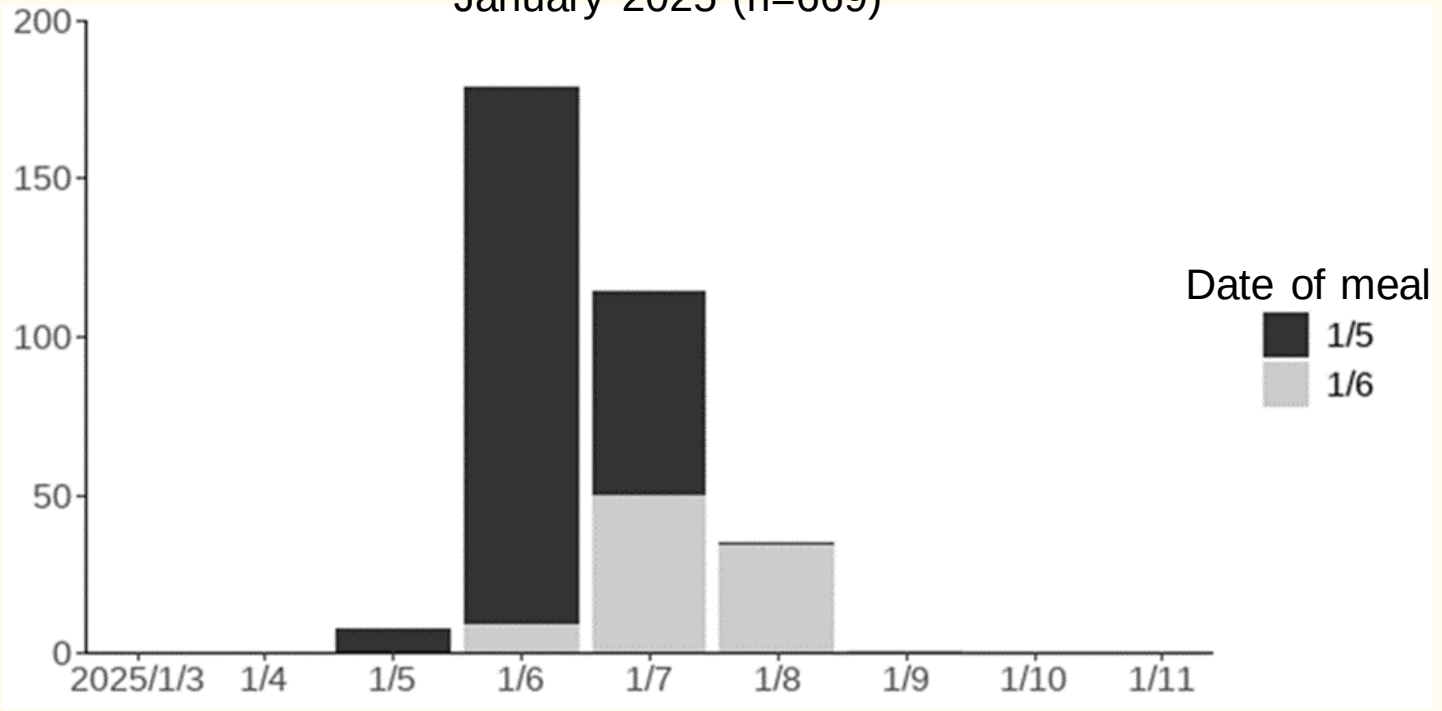
29.5 hours (range 2.5–63.5 hours)

Laboratory results

32 diners and 3 kitchen staff

tested **positive for norovirus**

Cases of the food-borne outbreak by date of onset, Taipei, Taiwan, January 2025 (n=669)



Case-Control Analysis of Buffet Food Items and Norovirus Infection

Food items	Case (n=337)		Control (n=205)		Univariate logistic regression OR (95%CI)	Multivariate logistic regression OR (95%CI)
	Exp	Non-exp	Exp	Non-exp		
Sashimi	**279**	**56**	**126**	**78**	**3.1 (2.1–4.6)***	**2.1 (1.3–3.3)***
Sushi	**312**	**23**	**141**	**63**	**6.1 (3.6–10.2)***	**5.1 (3.2–10.1)***
Seafood	266	70	154	50	1.2 (0.8–1.9)	–
Appetizer	208	120	109	93	1.5 (1.0–2.1)*	0.9 (0.6–1.4)
Salad	**152**	**174**	**67**	**133**	**1.7 (1.2–2.5)***	**1.7 (1.1–2.6)***
Grilled Meats	319	17	183	21	2.2 (1.1–4.2)*	1.9 (0.9–4.0)
Japanese Grilled and Fried Dishes	301	30	177	28	1.6 (0.9–2.8)	–
Dim sum	**167**	**167**	**72**	**130**	**1.8 (1.3–2.6)***	**1.8 (1.2–2.7)***
Dessert	308	28	179	26	1.6 (0.9–2.8)	–
Fruit	222	112	124	79	1.3 (0.9–1.8)	–

***Note**: Over 200 menu items were first consolidated into 32 through microbiological risk assessment. After analysis, items with identical univariate results (significant or not) were merged, leaving 10 food items for final analysis.*

Environmental Findings - Inner Kitchen

- Responsible for **both rice handling and raw seafood washing**
- Developed diarrhea on Jan 7

Did **not** consistently **wear gloves**

Environmental Findings - Sushi / Sashimi Combined Station

- Asymptomatic norovirus infection
- **Gloved hands rested behind back** during breaks

A chef **handled contaminated sushi** rice **later prepared sashimi** without proper handwashing

Conclusion

Sushi rice preparation area

- Adjacent to raw seafood area → **risk of cross-contamination**
- Possible transfer from **poor hand / glove hygiene**

Sashimi / Sushi

Cross-contamination in shared work area or from asymptomatic chef

Salad and dim sum

- Eaten by **<50 %** of cases
- No major preparation issues → **unlikely main vehicles**

Recommendations

Risk assessment

Use a **microbiological risk assessment** to support foodborne outbreak investigations

Hand hygiene

- Wash hands thoroughly
- Keep gloves used for **handling ready-to-eat food** clean and **change immediately** if contaminated

Separate prep areas

Keep **raw seafood** and **ready-to-eat food** preparation areas completely separate

Designated staff

Assign **different staff members** to handle seafood and sushi-rice preparation

Limitations

Reliance on preliminary pathogen hypothesis may misdirect risk assessment, missing the true source

No leftover food was available for testing

Delayed sampling may have missed some infections

Self-reported staff symptoms may be unreliable

Thank you