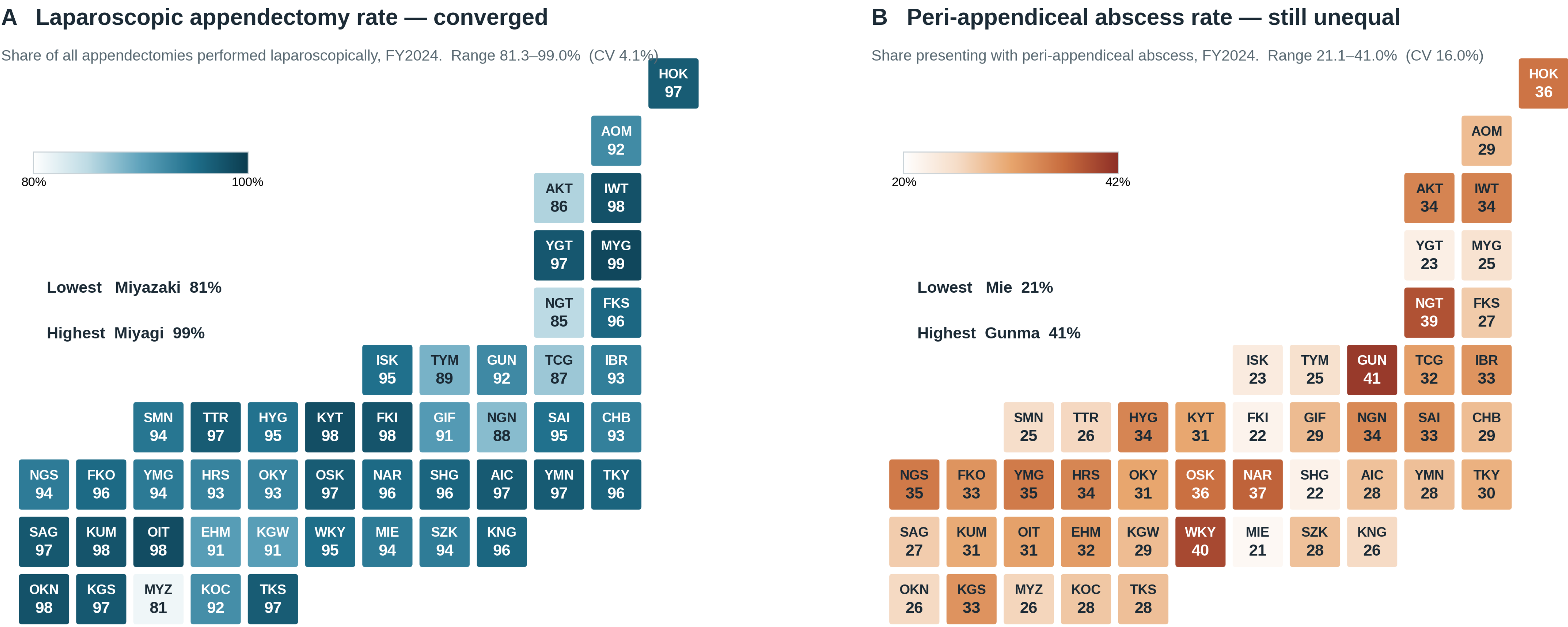


Where Japan stands now — every prefecture, FY2024



Source: NDB Open Data (11th release), MHLW, Japan — FY2024 inpatient claims for K718 and K718-2. Cells with counts <10 are suppressed by the publisher and were imputed at the midpoint of the possible range (1–9).

Three-letter codes are prefecture abbreviations. Left: the share of appendectomies performed laparoscopically — near-uniform nationwide. Right: the share of patients who reach surgery only after an abscess has formed — still almost two-fold between prefectures, and higher where the population is older.

1 Two policies, two kinds of surgery

- Japan is deliberately concentrating cancer surgery: robot-assisted low anterior resection rose from 16.8% to 41.2% of all low anterior resections, 2018–2023.
- That capability is unevenly held — 92.9% of designated cancer centres have introduced robot-assisted gastrectomy, against 28.6% of general hospitals.
- Appendicitis is the counter-case. It is unscheduled and time-dependent, and the patient arrives at whichever hospital is nearest, so the operation cannot be concentrated.
- WSES 2020 recommends laparoscopy over open appendectomy for uncomplicated and complicated disease alike (Rec. 4.1; evidence High, recommendation Strong, 1A).

Seishima R et al. Ann Gastroenterol Surg 2025;9:e70031 · Nakada S et al. Ann Gastroenterol Surg 2025;9:e70015 · Di Saverio S et al. World J Emerg Surg 2020;15:27.

2 Setting: one country, one price

Universal coverage, free access to any hospital without gatekeeping, and one national fee schedule. Prices are identical in every prefecture, so reimbursement is a national lever, not a local one.

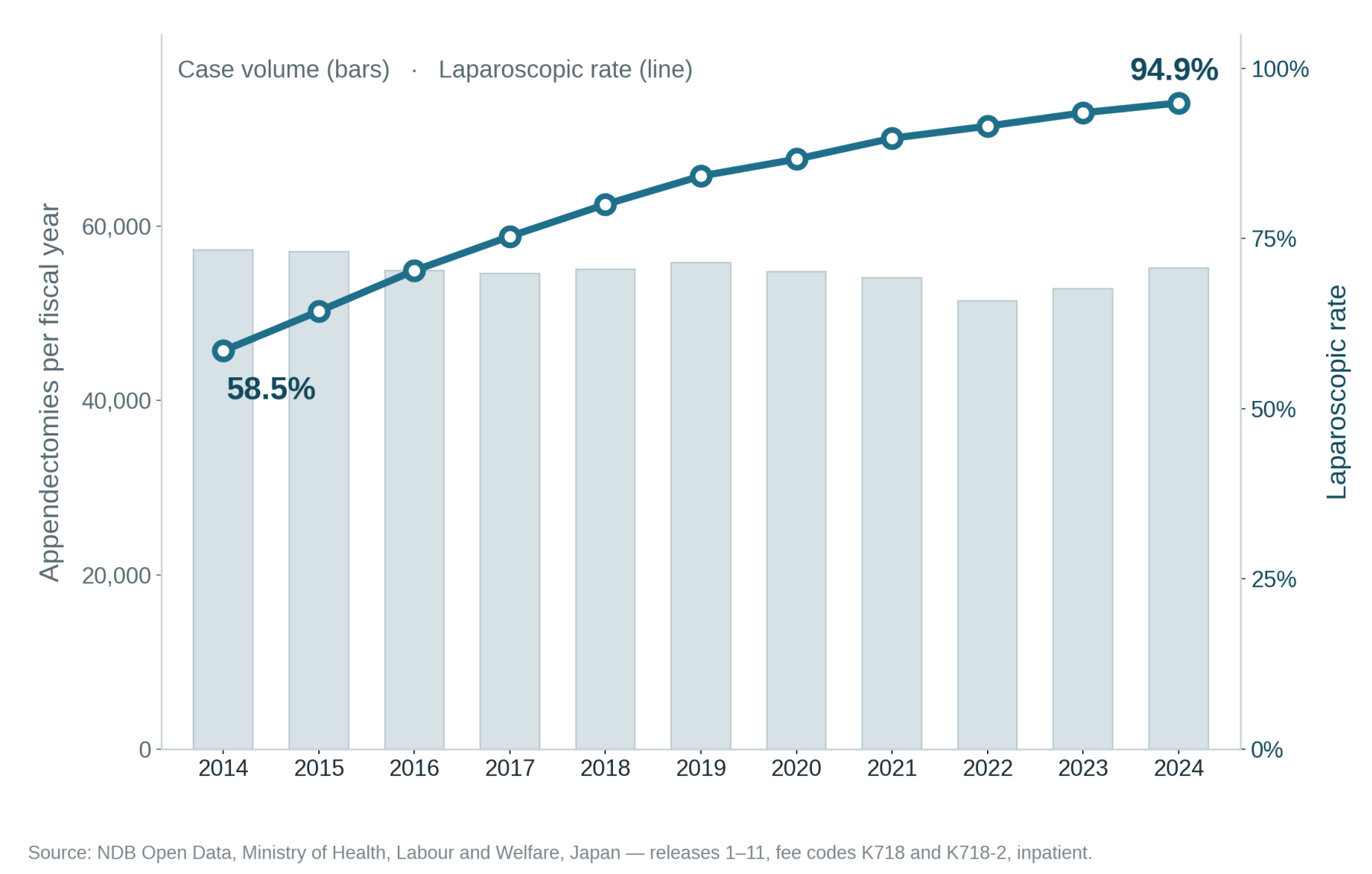
Procedure (national fee schedule)	Cost
Open appendectomy — K718	674,00(JPY)
Open, with peri-appendiceal abscess	888,00
Laparoscopic appendectomy — K718-2	137,600
Laparoscopic, with abscess	220,500

Laparoscopy is reimbursed at roughly twice the open rate — a uniform price signal introduced long before adoption converged. 1 point = JPY 10. Source: Medical fee schedule, FY2024 revision, MHLW, Japan.

3 Data and methods

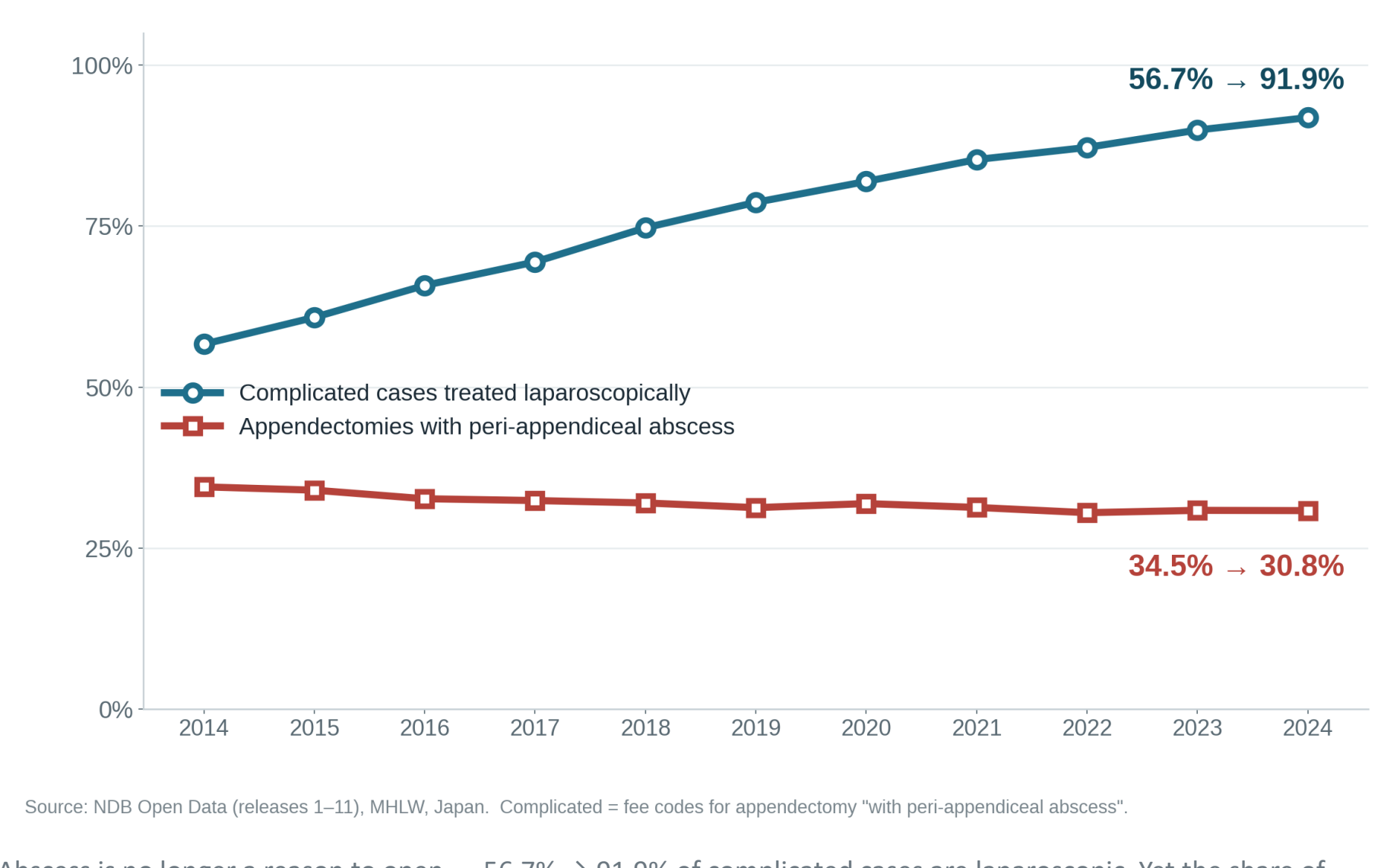
- All 602,927 inpatient appendectomies in NDB Open Data (releases 1–11), FY2014–FY2024 — a complete eleven-year national series.
- Fee codes K718 (open) and K718-2 (laparoscopic), each split into cases with and without peri-appendiceal abscess.
- Prefecture linkage: population and ageing (Statistics Bureau, 1 Oct 2024); surgeon supply and general beds (MHLW surveys).
- Counts under 10 are publisher-suppressed and imputed at the midpoint of 1–9, with 0 and 9 as sensitivity bounds.
- SD, coefficient of variation and range across 47 prefectures; Pearson correlation and multivariable regression (n = 47).

4 National diffusion



Bars: annual case volume (51,462–57,245) — essentially flat. Line: laparoscopic rate. A change of technique, not of indication. Japan's 94.9% sits just below Germany's 97.0% (Bopp J et al. World J Emerg Surg 2025;20:35).

5 Complicated appendicitis



Abscess is no longer a reason to open — 56.7% → 91.9% of complicated cases are laparoscopic. Yet the share of appendectomies performed for abscess barely moved, 34.5% → 30.8%. Severity is managed better, not prevented.

6 What explains the variation left?

Covariate (prefecture, FY2024)	β	P
Population aged 65 or over (%)	-0.66	0.017
Surgeons per 100,000	+0.12	0.46
General beds per 100 population	+6.23	0.20
Total population	≈ 0	0.97
Physician maldistribution index	+0.010	0.63

Multivariable linear regression, outcome = FY2024 laparoscopic rate, n = 47, R² = 0.21. Surgeon supply no longer constrains access to the technique; only demographic ageing retains an independent negative association.

Sources: NDB Open Data (11th release), MHLW · Population Estimates, Statistics Bureau of Japan, 1 October 2024 · MHLW Survey of Physicians 2014 · MHLW Survey of Medical Institutions 2018 · MHLW physician maldistribution index, January 2024.

Conclusions

- Regional variation in minimally invasive surgical adoption in Japan is associated more strongly with demographic ageing than with surgeon workforce density.
- Despite two- to threefold structural disparities, nationwide convergence was achieved: 58.5% → 94.9%, interquartile range 15.3 → 5.9 points.
- Standardised reimbursement and training may support equitable diffusion of surgical innovation even in a rapidly ageing society — a testable model for Asia Pacific.
- Additional analysis: diffusion of technique is not equity of access. As Japan concentrates surgery into 330 acute-care hubs from FY2027, the laparoscopic rate is a floor, not a signal.

Limitations

- Ecological design: prefecture-level associations do not imply individual-level causation.
- Wrong unit for current policy — the 330 secondary medical areas now used for planning sit inside these 47 observations, so within-prefecture variation is invisible.
- The abscess share is a proportion, not an incidence; non-operative and interval management are not identifiable in claims, so the true denominator of appendicitis is unknown.
- No clinical detail and no mortality or recurrence outcomes.