swissnoso

National Center
for Infection Control

Swissnoso Annual Report

Epidemiology and prevention of healthcare-associated infections in Swiss acute care hospitals in 2024

July 2025 | On behalf of the Federal Office of Public Health (FOPH)

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For Swissnoso[1]

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1 Members of Swissnoso: Dr Carlo Balmelli, Lugano; Dr Delphine Berthod, Sion; PD Dr Niccolò Buetti, Geneva; Prof. Stephan Harbarth, Geneva; Dr Philipp Jent, Bern; Prof. Jonas Marschall, Bern; Prof. Hugo Sax, Zurich; Dr Matthias Schlegel, St. Gallen; Dr Alexander Schweiger, Zug; PD Dr Laurence Senn, Lausanne; Prof. Rami Sommerstein, Lucerne; Prof. Nicolas Troillet, Sion; Prof. Sarah Tschudin Sutter, Basel; PD Dr Danielle Vuichard Gysin, Frauenfeld; Prof. Andreas Widmer, Basel; PD Dr Aline Wolfensberger, Zurich; Prof. Walter Zingg, Zurich

Table of Contents

Executive Summary

Aim: The 2024 Epidemiology Report by Swissnoso highlights the current state and envisioned advancements in surveillance and prevention of hospital-acquired infections (HAIs) in Swiss acute care hospitals.

Purpose: To provide details of the current status and inform initiatives to reach the operational goals set in the NOSO Strategy — namely, to reduce the national HAI point prevalence from 6% in 2022 to 5% by 2030 and 4% by 2035 — among other things by implementing the Structural Minimum Requirements for the Prevention and Control of HAI in Swiss acute care hospitals *(Minimum Requirements)*.[1,2]

Document structure: This report is organised according to Donabedian's model of structure, process and outcome quality in healthcare.[3] Structure is understood as established infection prevention and control (IPC) structures at the hospital level, Process as the level of adherence to evidence-based prevention measures by hospital healthcare professionals (HCPs), and Outcome as the occurrence of HAIs in patients and the level of antimicrobial resistance (AMR) in pathogens.

Available metrics data: **Structure** and **process** quality can currently be estimated from annual surveys, data from surveillance modules, and observations using the Swissnoso Clean Care Monitor (CCM) app. We do not report data on healthcare-associated respiratory viral infections for 2024 since hospital-based surveillance was stopped when the COVID-19 pandemic ended. **Outcome** data stem from four sources: the Swiss national point prevalence surveys of HAI and antimicrobial use (**CH-PPS**), the surgical site infection (**SSI**) incidence surveillance, the catheter-associated urinary tract infection (**CAUTI**) incidence surveillance, and the Swissnoso National Nosocomial Outbreak Investigation Centre.

More detailed information: Dedicated annual reports on Swissnoso modules provide more in-depth methodological details and results.[4]

RESULTS

1. HAIs and their prevention overall

Overall structure: In 2024, the ***Minimum Requirements Survey***[5] was introduced as a new component of the CH-PPS, precluding direct comparison with former years. Even so, the structural elements intervention, audits/monitoring, and training/education were again the least implemented.

Overall process: No overall process data to report

Overall outcome: **HAI point prevalence** was 5.7% for all participating hospitals in 2024, showing a slight downward trend over the last years. For 56 hospitals participating in all three national surveys in 2017, 2022 and 2024, the prevalence was stable at 6.1%, 6.2% and 6.2%, respectively.

What to be aware of: *Minimum Requirements Survey* data are prone to bias owing to self-reporting without external validation. Prevalence data are likely to over- or underestimate HAIs compared with incidence studies, especially in an era of strong efforts to reduce the length of hospital stay.

What it means: Stable prevalence over time means that 1) there is room for improvement in terms of IPC structure and process quality but also that 2) neither the pandemic nor the increasing complexity of patient care has increased HAI point prevalence. The case mix (McCabe) has remained unchanged!

What to do next: Conducting HAI-prevalence surveys is mandatory according to the *Minimum Requirements* and will thus serve as a main metric for the NOSO Strategy 2030 and 2035 goals. Future point prevalence surveys may report intrinsic risk-adjusted results. The planned Swissnoso *IPC Platform and Quality Improvement Project* will eventually produce more actionable data, hopefully leading to lower HAI rates and AMR.

1 https://www.bag.admin.ch/en/minimum-requirements-for-hospitals and https://www.swissnoso.ch/forschung-entwicklung/strukturelle-mindestanforderungen-hai/ueber-die-strukturellen-mindestanforderungen

2 In this report, we use the term «hospital» also for hospital networks whenever they appear as an individual entity.

3 Donabedian, A. (1988). The quality of care: How can it be assessed? JAMA, 260(12), 1743-1748. http://www.wonk1.com/hilbert/3%20%202016%20Donabedian--The%20qualtiy%20of%20care%20how%20can%20it%20be%20assessed.pdf

4 Available at https://www.swissnoso.ch

5 Minimal Requirements Survey: https://www.swissnoso.ch/forschung-entwicklung/strukturelle-mindestanforderungen-hai/ueber-die-strukturellen-mindestanforderungen

2. Surgical site infections (SSI)

SSI structure: One quarter of responding hospitals still lack written guidelines for SSI prevention.

SSI process: Bundle adherence for antimicrobial prophylaxis, skin disinfection and correct hair removal was 79.5% in 12 hospitals participating in the 2024 SSI Intervention module, a 50% increase versus 2019. The three additional prevention measures introduced in 2023 (see full text) show an improvement trend in the 5–8 reporting hospitals from 32–65% to 50–76%.

SSI outcome: A decreasing trend in SSIs is observed in 9 types of surgery, while 5 show equal or increasing trends.

What to be aware of: Hospital participation in the SSI Intervention module remains low, with an average of fewer than 20 non-randomised observed surgeries per year and hospital.

What it means: SSI incidence shows a downward trend in Switzerland with some exceptions despite the increasing age of the population. Participation in SSI Intervention seems to have a positive effect on SSI prevention measure adherence. The low adherence to the three ‹new› prevention measures shows that there is still a gap in the comprehensive implementation of evidence-based prevention measures in Swiss hospitals. SSI surveillance and monitoring continue to require considerable manual effort for IPC teams.

What to do next: Strengthen guideline availability and adherence improvement initiatives in hospitals. Include SSI surveillance and monitoring (including the Swiss National Joint Registry – SIRIS) in the *IPC Platform and Quality Improvement Project* with automated data management and rapid result notification. Consider integrating case-mix adjusted rates in the next report. Issue national Swissnoso guidelines for SSI prevention to support hospitals in implementing all recommended measures.

3. Catheter-associated urinary tract infections (CAUTI)

CAUTI structure: Of the 96 reporting hospitals, 53% report CAUTI guidelines, 34% CAUTI surveillance and only 15% a CAUTI intervention – less than in 2023.

CAUTI process: While urinary catheters were placed **without** justification remains stable at approximately 10%, catheter density (as surrogate for potential overuse) shows an increasing tendency.

CAUTI outcome: The CAUTI rate showed a decreasing trend from 1.43 (2023) to 1.12 (2024) per 1.000 catheter days (from 1.39% to 1.10% respectively in consistently participating hospitals).

What to be aware of: The small number of participating hospitals, non-representative on a national scale owing to geographical bias. The observed (but unlikely) decrease in the availability of guidelines in Swiss hospitals questions the quality of structure data.

What it means: A decreasing trend in CAUTI rates shows that improvement is still achievable. Only a few hospitals have established surveillance, with even fewer having implemented targeted interventions.

What to do next: Foster guideline availability and prevention efforts in all Swiss hospitals. Verify data quality (i.e., unlikely decreasing availability of guidelines).

4. Antimicrobial resistance (AMR)

AMR structure: Guidelines on antibiotic treatment or perioperative antimicrobial prophylaxis and supportive clinical consulting are available in most hospitals, while a minority (40%) sustain a formal antimicrobial stewardship programme and provide education for HCPs or restrict antimicrobial use.

AMR process: The annual point-prevalence for patients on antimicrobials has further increased to 36% in 2024. Overall hand hygiene adherence remains stable at around 80% or is decreasing. Notably, in hospitals implementing the 4-moment concept, doctors' adherence surpassed that of nurses and others for the first time.

AMR outcome: In 2024, several clusters of vancomycin-resistant enterococci (VRE) were reported on an inter-hospital and inter-regional basis. According to CH-PPS data, the proportion of resistant pathogens remains stable, apart from an increase in VRE and carbapenem-resistant *Pseudomonas aeruginosa* (CRPA). Evolution of antimicrobial resistance (AMR) in Swiss acute care hospitals is reported in the Swiss Antibiotic Resistance Report (SARR) and on the on the dashboard of the Swiss Centre for Antibiotic Resistance (ANRESIS).

What to be aware of: Potential biases in surveys, manual observations, and reporting

What it means: Antimicrobial resistance remains quite stable in Switzerland judging by the CH-PPS data (except for VRE and CRPA the prevalence of which has increased). Antimicrobial prescription guidelines are prevalent and consultation services largely available. In contrast, there is a need for improved education, more stringent interventions and formal programmes. The prevalence of patients on antimicrobials seems to be increasing, potentially confounded by a change in methods.

What to do next: Consider including the proportion of AMRs in indicator pathogens based on ANRESIS data.

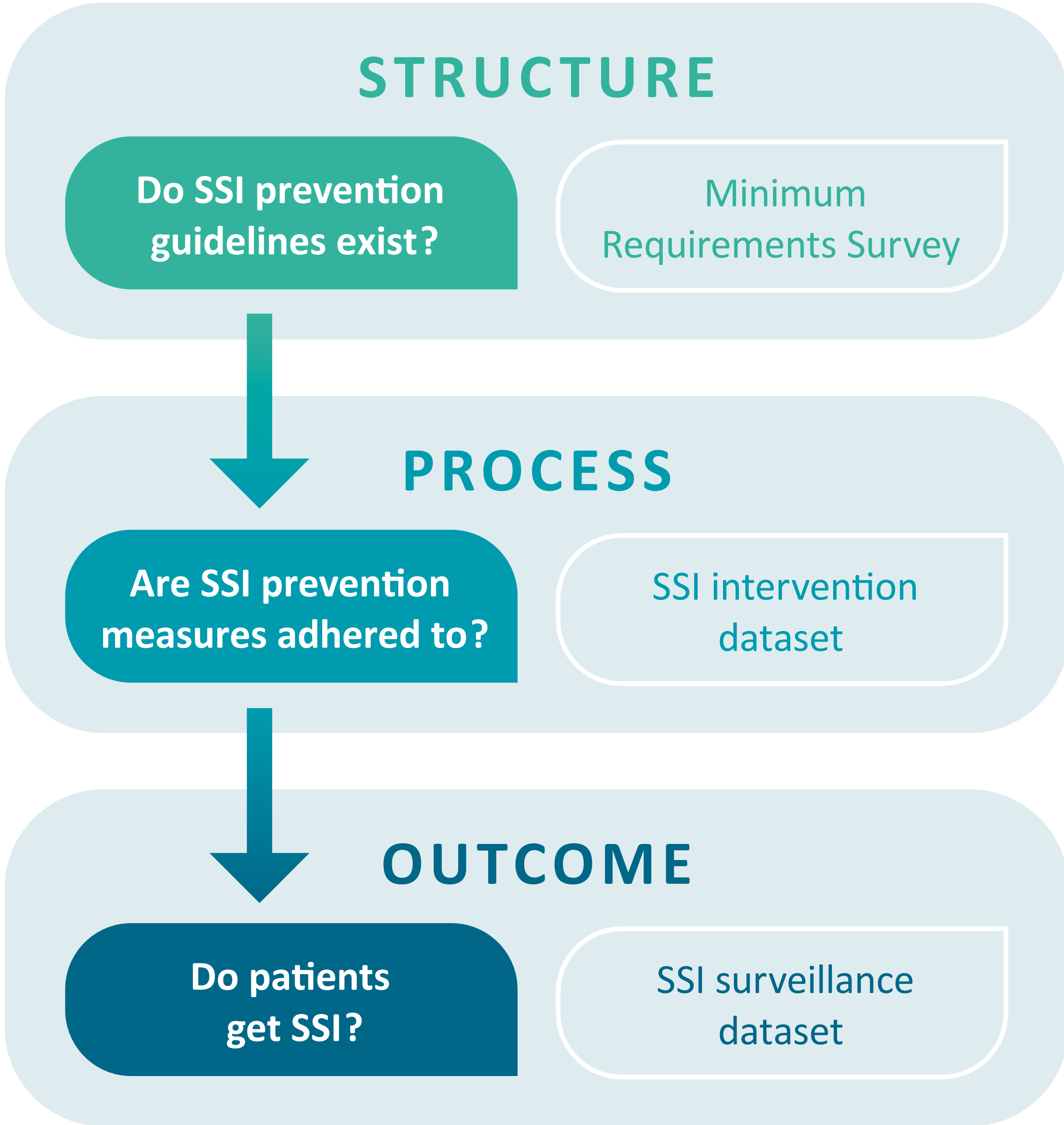
5. Discussion

While overall HAI prevalence has not yet decreased, the SSI and CAUTI incidence rates show a promising evolution overall. As for AMR, a discussion is planned to integrate dedicated analyses based on ANRESIS data as AMR outcome parameter in a future annual report. Interestingly, the case mix (McCabe) of consistently participating CH-PPS hospitals has remained unchanged since 2017. The McCabe score appears to be a valid parameter, as it shows a clear correlation with overall HAI prevalence.

While SSI, CH-PPS and CAUTI are established surveillance schemes, the value of the latter two as national evolution metrics is somewhat challenged by changing participation; CAUTI is further affected by lower hospital participation. At the hospital level, annual HAI prevalence and incidence data are criticised as being too rare to guide and evaluate interventions and will have to be complemented by automated monitoring of process indicators and adherence rates. Integration of case-mix adjustment in future reports must be discussed, as well as participation in CH-PPS surveys, to make it solid as a national goal metric for 2030 and 2035.

IPC structure quality remains largely unchanged from previous years, with the lowest scores consistently observed in the areas of interventions, education and training, and audits/monitoring, as seen in both the ***Minimum Requirements Survey*** and the ***2024 StAR-3 Project Survey on Antimicrobial Stewardship***. The work involved in manual data retrieval and entry, administrative work and a lack of personnel resources are cited as reasons for this observation.

Recommendations made in last year's report are subject to ongoing discussions and will be addressed within the scope of the renewed mandate and additional funded activity by the FOPH, as well as by the Swissnoso *IPC Platform and Quality Improvement Project,* a mandate by the Federal Quality Commission EQK.



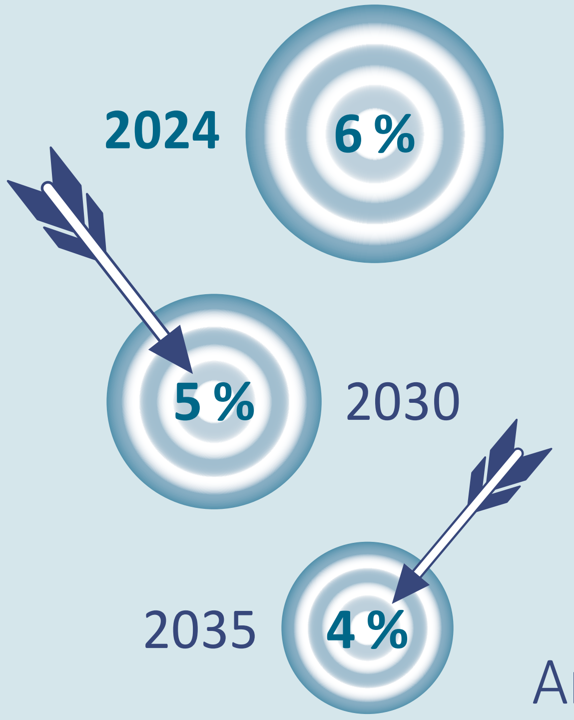
Donabedian's quality improvement framework applied to this report (example: surgical site infections).

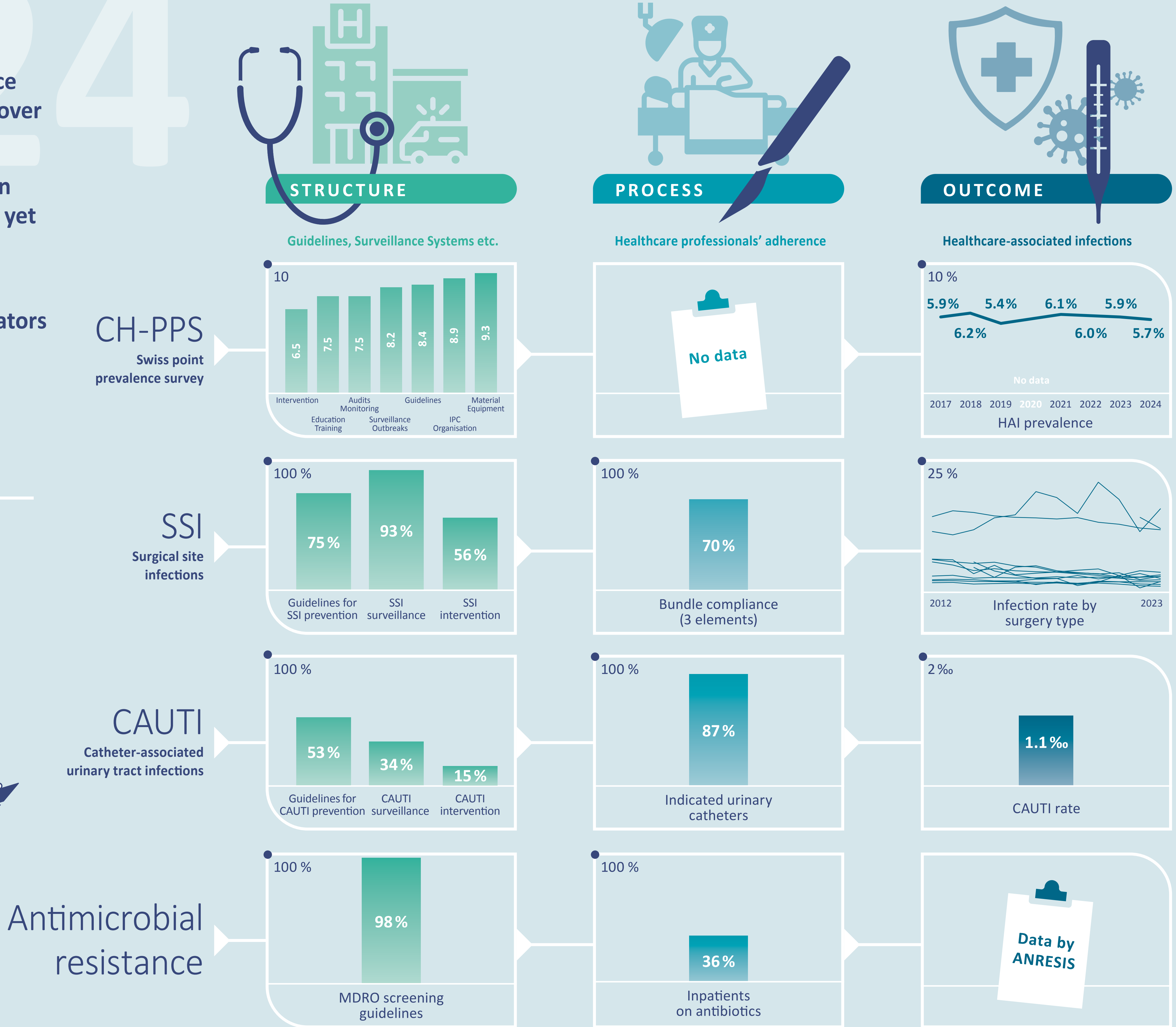
The Donabedian quality model is a framework for evaluating healthcare quality by examining three key areas: structure (the setup and resources), process (how care is delivered), and outcomes (the results of care). Donabedian, A. (1988). The quality of care: How can it be assessed? JAMA, 260(12), 1743-1748.

Epidemiology and prevention of healthcare-associated infections in Swiss acute care hospitals in 2024

- **Yearly HAI point prevalence has remained unchanged over the past 8 years.**
- **SSI rates have decreased in 9 types of surgery but not yet in 5 others.**
- **Improved monitoring and reporting of process indicators will stimulate IPC efforts.**

Swiss HAI prevalence goals





Epidemiology and prevention of healthcare-associated infections in Swiss acute care hospitals in 2024

swissnoso

1. Infection prevention and control of HAIs in Swiss acute care hospitals

The declared goal of the NOSO Strategy is to achieve 5% prevalence for HAIs by 2030, five years from now, and 4% in 2035.

STRUCTURE

IPC structures in Swiss acute care hospitals

The ***Minimum structural requirements for the prevention and control of HAIs in Swiss acute care hospitals*** (*Minimum Requirements* for short) were developed by Swissnoso and other key actors and published in 2021. A similar concept served as the backbone for a global initiative launched by WHO in 2019. Aiming to advance the local implementation of IPC in acute care hospitals, the *Minimum Requirements* support both the national NOSO Strategy (reducing HAIs) and the national Strategy on Antimicrobial Resistance (StAR; reducing antimicrobial resistance). The standards strongly encourage hospitals to engage in surveillance, adherence monitoring and prevention efforts. They are accompanied by a handbook, designed to help IPC teams to implement IPC structures, and the *Minimum Requirements Survey* distributed in conjunction with the Swissnoso HAI prevalence surveys, CH-PPS).[1] The *Minimum Requirements Survey* assesses seven key components: IPC policies, materials, staffing, training, monitoring, surveillance and interventions **(Annex 1)**. The survey is completed by the designated IPC lead at each participating hospital.

What we observed

Larger hospitals achieved higher scores than smaller hospitals and medium-sized hospitals had the lowest scores **(Figure 1)**. These differences were not statistically significant. Overall scores per key component are shown in **Figure 2**.

What to be aware of

Minimum Requirements Survey data from 96 CH-PPS hospitals might be associated with desirability and participation bias. Larger hospitals were overrepresented.

What it means

Larger hospitals tended to achieve higher scores, possibly reflecting greater resources or more established IPC structures **(Figure 1)**. There is still room for improvement in terms of IPC structure, particularly in the areas repeatedly identified in previous years: interventions, education and training for HCPs, and audits and monitoring **(Figure 2)**.
A correlation between hospital scores in the *Minimum Requirements Survey* and HAI prevalence was not found (data not shown).

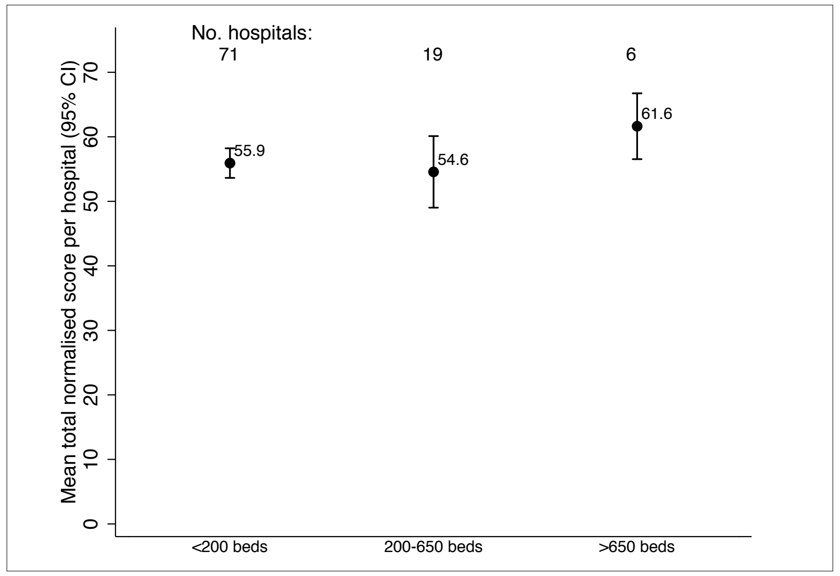


Figure 1. Overall *Minimum Requirements Survey* mean scores (maximum 70) of hospitals by size in 2024.

Minimum Requirements Survey (distributed with the CH-PPS 2024; **Annex 1**)[1] Based on a weighted score, each of the 7 key components could contribute 0 to 10 points to this standardised overall score. The graph shows the mean of the total normalised scores and a 95% confidence interval for all participating hospitals per hospital size group.

1 https://www.swissnoso.ch/forschung-entwicklung/strukturelle-mindestanforderungen-hai/ueber-die-strukturellen-mindestanforderungen

What to do next

A correlation between HAI prevalence or incidence rates and specific structural qualities in hospitals (as available in the *Minimum Requirements Survey*) might inform priorities. The Swissnoso *IPC Platform and Quality Improvement Project* can support hospitals in pivoting to more proactive IPC activity structures.

PROCESS

Swissnoso has not defined an overall process quality metric for HCP adherence to prevention measures in Swiss acute care hospitals. However, the reader can find process-quality data presented in each of the following specific chapters.

OUTCOME

HAI point prevalence study (CH-PPS)

Swissnoso has invited Swiss acute care hospitals to participate in annual Swiss HAI point prevalence surveys (CH-PPS) since 2017 (except for the 2020 COVID-19 pandemic year). Detailed information on survey methodology can be found in the dedicated report **(Annex 2)**.[2]

The years 2017, 2022 and the current year 2024 are considered «national» owing to broader hospital participation in these years.

What we observed

HAI prevalence has remained at around 6% in the yearly CH-PPSs since 2017 for the entire dataset of all (inconsistently) participating hospitals. There has been a statistically non-significant downward trend in the last few years **(Figure 3)**.

HAI prevalence among the 56 hospitals that participated in all three surveys declared «national» remained slightly above 6%, without any significant change **(Figure 4)**.

What to be aware of

First, hospital participation has varied over the years. Since 2017, only nine hospitals have participated consistently every year (of which five are located in the same canton). Therefore, it was decided to display the results for the 56 hospitals participating in all three «national» surveys (2017, 2020 and 2024) in this report.

Second, prevalence surveys overestimate HAI rates because patients with longer hospital stays in are more likely to suffer from HAIs that are then detected. This bias could be amplified by a trend towards shorter stays in the general Swiss patient population, which may concentrate and condense the proportion of infected patients included in the annual CH-PPS even further.

Third, HAIs with a longer duration of symptoms are overrepresented. Patients with HAIs acquired in another hospital or transferred to another hospital after HAI acquisition in the surveyed hospital can be misclassified.

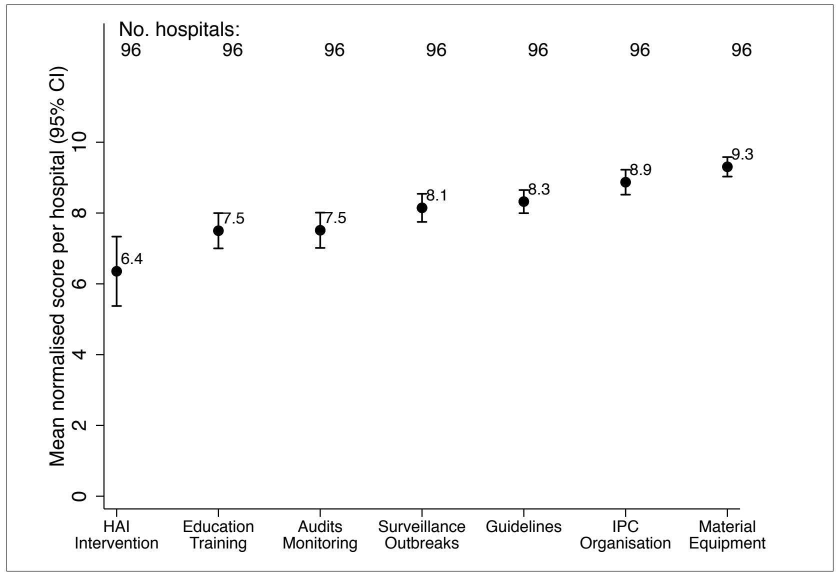


Figure 2. *Minimum Requirements Survey* mean scores (maximum 70) for hospitals by key components in 2024.

Minimum Requirements Survey (distributed with the CH-PPS 2024; **Annex 1**). Hospitals could achieve different scores for each key component of the survey instrument, based on the extent of implementation as captured by the corresponding sub- and sub-sub-questions. For each key component, hospitals achieved a weighted score derived from the corresponding sub-questions, which was then normalized to a scale from 0 to 10 points (see **Annex 1** for details). This graph shows mean scores and 95% confidence intervals among participating hospitals.

2 CH-PPS 2024: https://www.swissnoso.ch/module/punktpraevalenz-erhebung-hai/resultate

Fourth, differences in the severity of HAI types are not captured in the overall prevalence result; for example, the overall HAI prevalence may stay the same despite a shift from a large proportion of CAUTIs (a less severe HAI type) to a large proportion of SSIs (a more severe HAI type; **Figure 5**).

Fifth, despite all efforts to homogenise surveillance methods and validate multiple PPS observers, variations remain when it comes to detecting and documenting mild HAIs (e.g. oropharyngeal or urogenital candidiasis).

Sixth, CH-PPS results are not case-mix adjusted, which would be necessary for inter-hospital comparison and international benchmarking and inform the evolution of trends over time. **Figure 6** illustrates the influence of case mix on HAI prevalence. However, the case mix (McCabe) has not significantly changed since 2017 in the 56 hospitals consistently participating.

Finally, many HAIs are linked to specific risk factors (e.g. device-associated infections or surgery); however, the inevitable inclusion of patients in the denominator who do not share these risk factors dilutes prevalence estimates.

What it means

Annual point prevalence surveys, despite their methodological shortcomings, constitute the preferred method for checking progress in IPC efforts in a large population. The main advantage is that they provide a view of all HAIs among all inpatients, not only those selected for incidence studies. However, the main challenge when it comes to using these data as metrics to track progress towards the declared 5%-goal in 2030 is the changing participation of hospitals. The impact of this variation on prevalence can be seen by comparing the results in **Figure 3 and 4.** For the moment, the most valid numbers available for us to estimate the development come from the 56 hospitals participating in the three national surveys, fairly representative of Swiss acute care hospitals in terms of referral status and regional location with a slight overrepresentation of larger hospitals (data not shown).

The factors associated with a higher HAI risk on the patient level are age, male sex and a life-shortening underlying disease (McCabe 2 or 3), and on the institutional level bigger size and more advanced medical care (higher referral and university status), which correlate with a more vulnerable case mix (higher McCabe) (data not shown).

Efforts to curb HAI prevalence in Swiss hospitals do not seem to be bearing fruit yet – at least judging by the findings of the 56 hospitals consistently participating and over the period since 2017. In these hospitals, we do not see a correlation between the hospital's IPC structure quality *(Minimum Requirements Survey)* and HAI prevalence (data not shown).

What to do next

The data suggest that more targeted efforts are needed to curb HAI prevalence on both the hospital and the national level. In our view, this requires data on the process level, i.e. adherence to evidence-based HAI-targeting prevention measures. A more detailed analysis of declared prevention efforts in the *Minimum Requirements Survey* and HAI prevalence might show a correlation.

The Swissnoso *IPC Platform and Quality Improvement Project* – for which funding has recently been granted by the Federal Quality Commission (EQK) – will support effective prevention efforts.

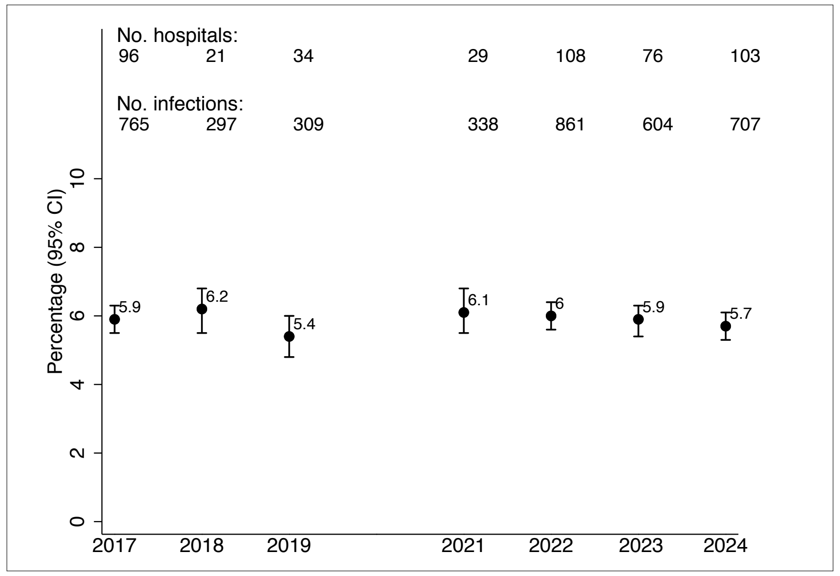


Figure 3. Swiss Point Prevalence Survey (CH-PPS): evolution of HAI prevalence in all participating hospitals, 2017-24.

HAI prevalence from 2017 to 2024. Note: In 2020, CH-PPS was skipped due to COVID-19 workload.

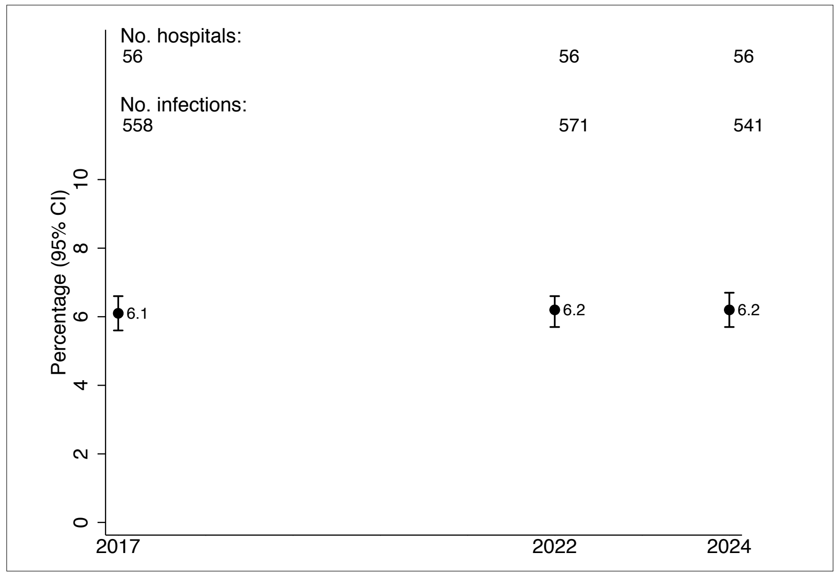


Figure 4. Swiss nationwide Point Prevalence Survey (CH-PPS): evolution of HAI prevalence in 2017, 2022 and 2024 in the 56 hospitals participating in all three years.

HAI prevalence in 2017, 2022 and 2024. Note: In 2020, CH-PPS was skipped due to COVID-19 workload.

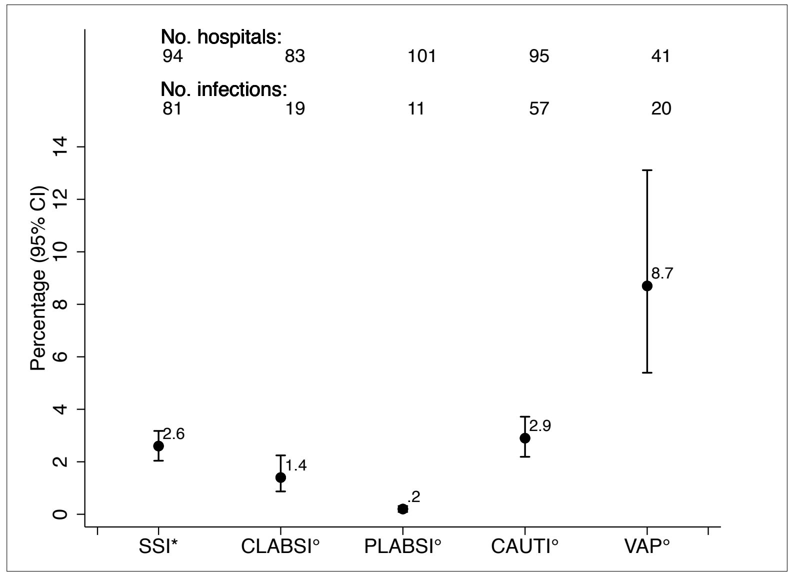


Figure 5. Swiss Point Prevalence Survey (CH-PPS) 2024: surgery- and device-associated HAIs.

Device-associated HAIs and surgical site infections in patients at risk; * number of surgical site infections (SSI) identified during the current hospital stay among all NHSN (national healthcare safety network)-defined surgical procedures performed during the same hospital stay; ° number of infections per number of patients exposed to the relevant medical device/invasive procedure on the PPS day; SSI: surgical site infections; CLABSI: central line-associated (bloodstream) infection; PLABSI: peripheral line-associated (bloodstream) infection; CAUTI: catheter-associated urinary tract infection; VAP: ventilator-associated pneumonia (pneumonia with intubation).

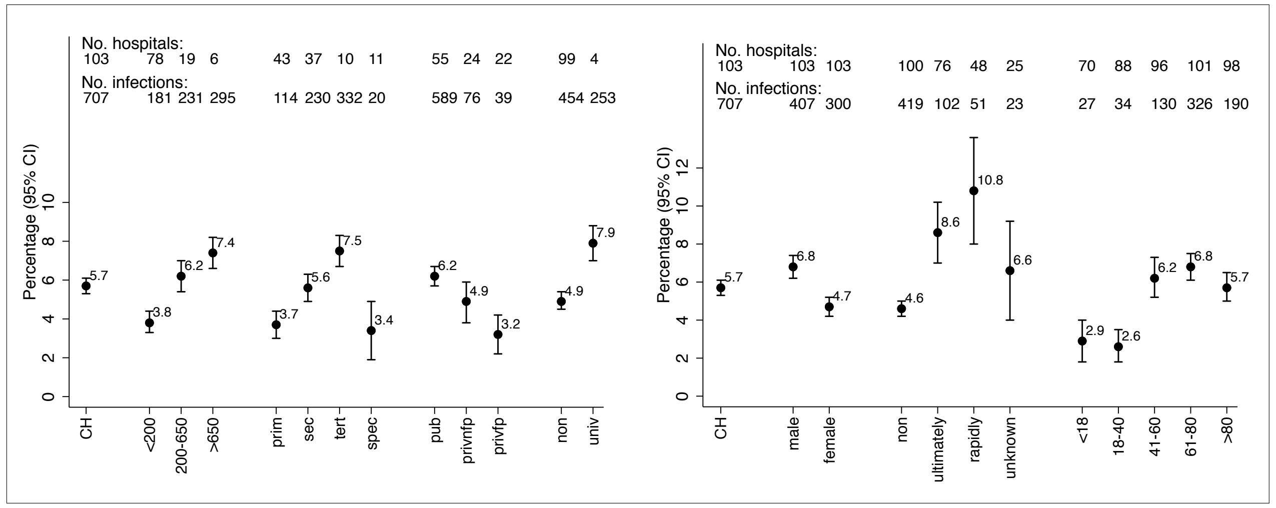


Figure 6. Swiss Point Prevalence Survey (CH-PPS) 2024: HAI prevalence by hospital type (left) and intrinsic risk factor (right)

CH: Switzerland; hospital size: <200 beds (small), 200-650 beds (medium size), >650 beds (large); hospital type: primary care, secondary care, tertiary care, specialised hospital (note: paediatric clinics [n=2] not shown); hospital ownership: pub (public), privnfp (private, not-for-profit), privfp (private, for-profit); university-affiliation: not affiliated (non), affiliated (univ); McCabe: non-fatal, rapidly-fatal, ultimately-fatal, unknown; age: <18 years, 18-40 years, 41-60 years, 61-80 years, >80 years.

2. Surgical site infections (SSI)

STRUCTURE

IPC structures for SSI prevention

What we observed

Swissnoso has access to data on three SSI-related structure quality elements in Swiss acute care hospitals based on the *Minimum Requirements Survey*: 1) the in-hospital availability of guidelines for SSI prevention; 2) participation in the Swissnoso-ANQ SSI Surveillance module, and 3) the existence of a formal intervention to increase adherence to SSI prevention measures **(Figure 7)**.

What to be aware of

Minimum Requirements Survey data from 96 CH-PPS hospitals might be associated with desirability and participation bias. Larger hospitals were overrepresented.

What it means

While participation in the SSI Surveillance module is almost universal among the 96 survey participants, only three quarters of hospitals have a written guideline on SSI prevention, and only slightly over half declare an SSI intervention. The latter figure is noteworthy, since only 6 of these 53 hospitals participate in the Swissnoso SSI Intervention module.

What to do next

A national Swissnoso SSI prevention guideline is warranted to support hospitals in maximising their efforts to prevent surgical site infections. We recommend including practical guidance on how to adapt these national guidelines for implementation at the local hospital level. It would be informative to know more about the nature of the interventions declared by 53 Swiss hospitals.

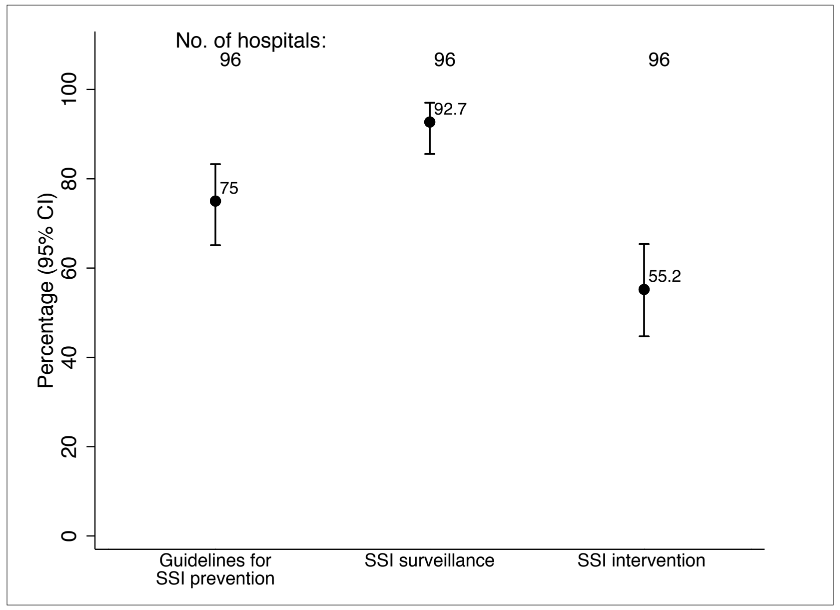


Figure 7. Hospitals reporting on structural components related to SSI prevention, 2024.

Minimum Requirements Survey (distributed with the CH-PPS 2024).

PROCESS

Adherence to SSI prevention measures

The Swissnoso SSI Intervention module was created in 2019 to accelerate the prevention of SSIs by providing Swiss hospitals with guidance and tools for multimodal interventions. The module promotes the three SSI prevention measures: «timely antimicrobial prophylaxis», «correct skin disinfection» and «adequate hair removal». In 2023, three additional prevention measures were included: «preoperative bowel decolonisation for colon surgery», «preoperative *Staphylococcus aureus* decolonisation» and «perioperative glucose control».

The datasets used for this section originate from two different sources: the Clean Care Monitor-SSI mobile app (all measures) and the SSI Surveillance dataset (timely antimicrobial prophylaxis). In 2024, the app was used by 12 hospitals (6 of them participating in the SSI Intervention module), while 150 hospitals contributed to the SSI Surveillance module in 2024.

What we observed

Data collected within the SSI Intervention module show that the bundle adherence for the three initial bundle elements, defined as «all three prevention measures applied to a patient», showed an increasing tendency between 2019 and 2024 **(Figure 8)**. Among patients receiving antimicrobial prophylaxis, 94% receive it within an hour prior to incision (78% in 2023).

This finding, originating from 12 hospitals using the CCM-SSI mobile app, is consistent with data from the 150 participants in the national SSI Surveillance module, showing a significant overall improvement in the correct timing of antimicrobial prophylaxis (i.e. within 1 hour before incision) from 77.6% (95% CI: 77.2–78.0) in 2013 to 84.1% (83.8–84.3) in 2023 **(Figures 9 and 10)**. However, a number of surprising findings over time, e.g. for laminectomy with implant **(Figure 10)**, call for further explanation. Adherence to the three newly introduced SSI prevention elements in 2023, «preoperative bowel preparation in colon surgery», «preoperative *Staphylococcus aureus* decolonisation», and «perioperative glucose control», was very low in the first assessment in 2023 but showed a statistically non-significant upward trend in 2024. First published by WHO in 2016 as the standard of care, these elements require further support to be effectively integrated into routine hospital practice.

According to the SSI Surveillance dataset **(Figures 9 and 10)**, the decline in antimicrobial prophylaxis quality in gynaecology/obstetrics ceased in 2023. The low rate can be explained by delayed antimicrobial prophylaxis after cord clamping. The optimal timing of antimicrobial administration for this type of surgery has been controversial for years.

What to be aware of

CCM-SSI mobile app data **(Figure 8)**:

- The number of observations per hospital and year is low (on average, approx. 17 observed surgical interventions per hospital in 2024), resulting in large confidence intervals in hospital-level data.
- Observations are non-randomised, which can introduce bias. Information on why and where observations took place is not available.

SSI Surveillance antimicrobial prophylaxis timing data **(Figures 10 and 11)**:

- Adherence data for antimicrobial prophylaxis do not account for those cases where antimicrobial prophylaxis was not indicated.

What it means

There is an increasing adherence among surgical and anaesthesia staff to established SSI prevention measures witnessed in (a few) Swiss acute care hospitals. However, given the limited number of hospitals reporting data on SSI prevention measures in 2023, it can be cautiously hypothesised that evidence-based SSI prevention measures endorsed by international SSI prevention guidelines (e.g. WHO)

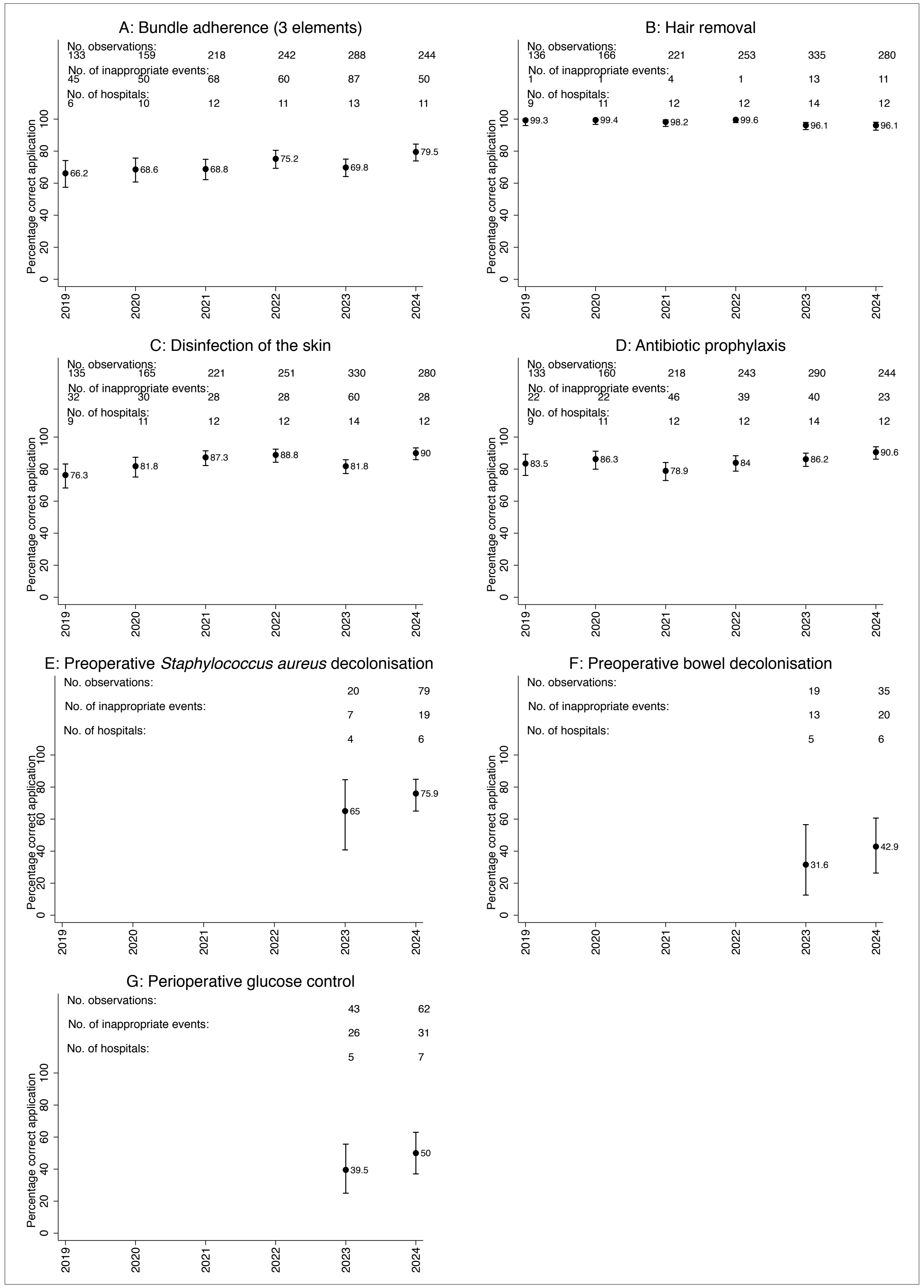


Figure 8. Adherence to SSI prevention measures, 2024.

CleanCare Monitor (CCM-SSI) data based on manual observations with CCM instrument. Panel A shows bundle adherence to the three elements hair removal (B), skin disinfection (C) and antimicrobial prophylaxis (D). The three elements «preoperative bowel decolonisation» (F), «preoperative Staphylococcus aureus decolonisation» (E), and «perioperative glucose control» (G) were introduced in 2023; however, no patient was observed for all 3 of these prevention measures, precluding a bundle adherence score.

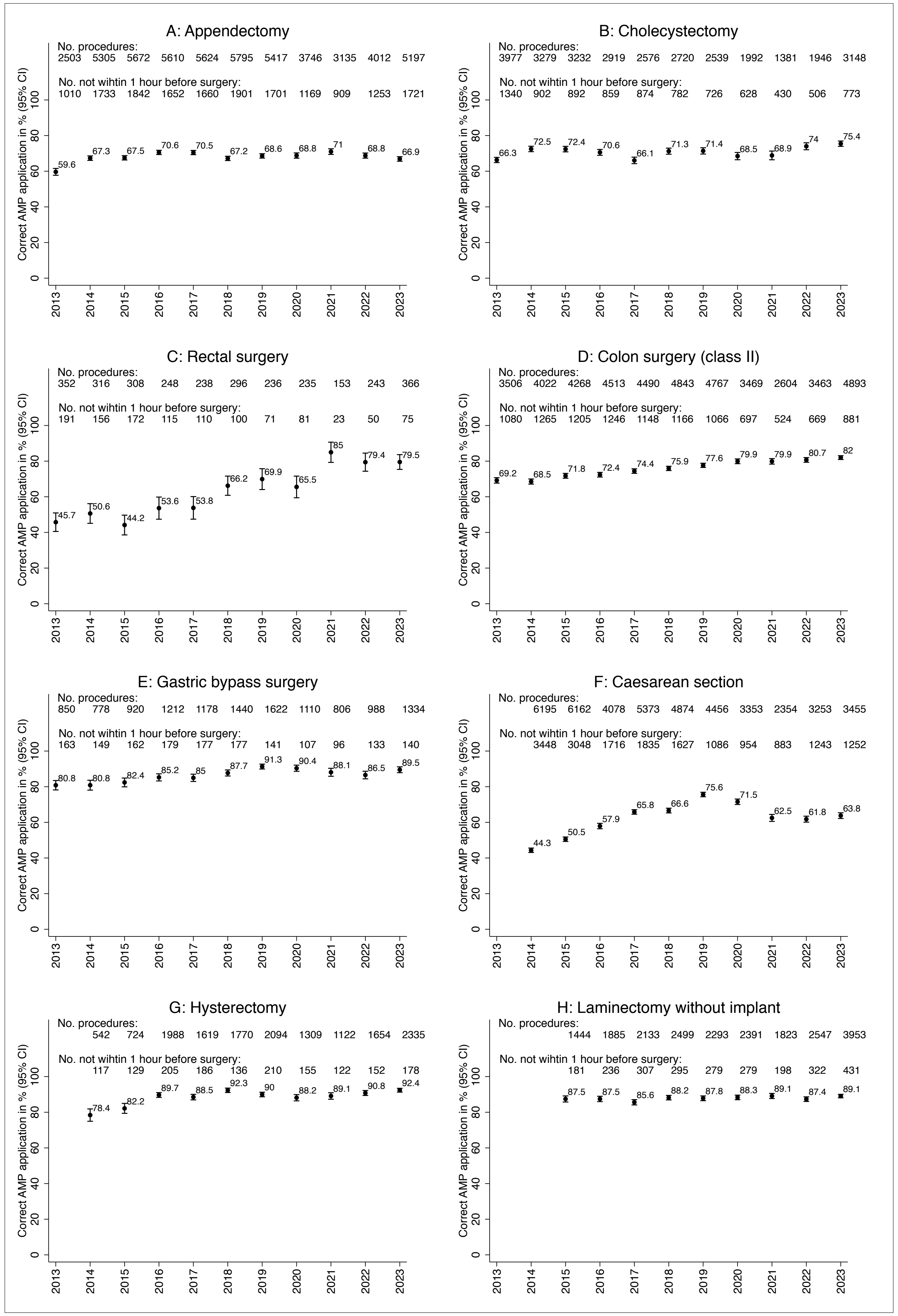


Figure 9. Surgery without implant: administration of antimicrobial prophylaxis within 1 hour before incision, 2022–2023

SSI Surveillance data for the period 1 October 2022 to 30 September 2023. AMP, antimicrobial prophylaxis.

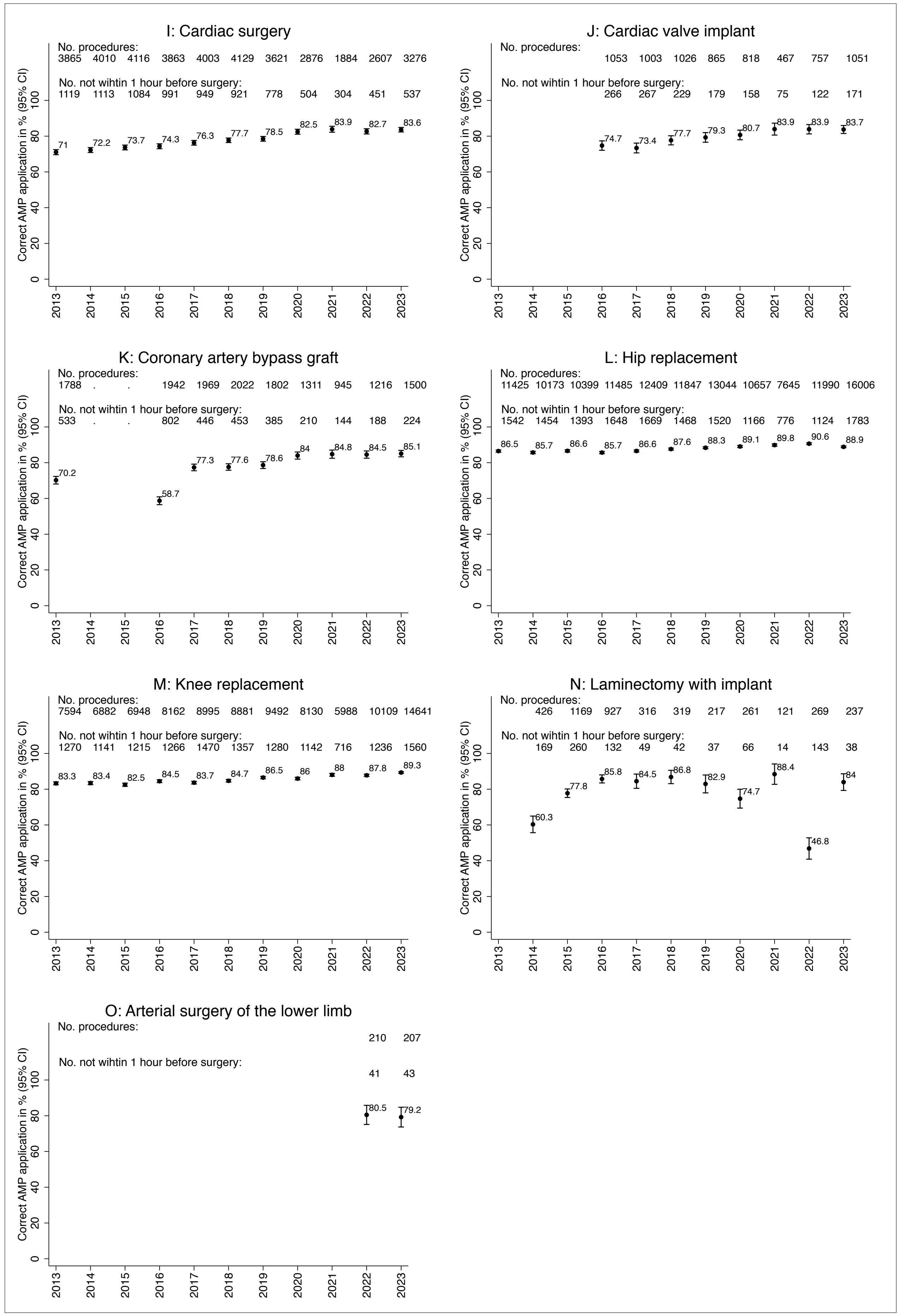


Figure 10. Surgery with implant: administration of antimicrobial prophylaxis within one hour before incision, 2022–2023

SSI Surveillance data for the period 1 October 2022 to 30 September 2023.

– but not actively promoted by Swissnoso – may remain unrecognised or unimplemented in Swiss hospitals. Whether this is because these measures are seen as ineffective or simply as too difficult to implement remains unclear. Nevertheless, the trend is positive.

What to do next

It would be desirable to obtain data on the reasons for the poor uptake of internationally recommended SSI prevention measures – whether in the context of the Swissnoso SSI Intervention module or any other prevention module. Interactions with relevant stakeholders (e.g. surgical societies) are planned.

Guidance and exchange on promotional strategies must be increased, e.g. fostering interdisciplinary collaboration between surgeons, anaesthetists and IPC, the lack of which is often cited as a barrier (based on anecdotal evidence). The merging of the SSI Surveillance and SSI Intervention modules must be discussed to be able to benefit from related data and provide guidance on improving adherence to more Swiss hospitals. We suggest a target of ≥90% for bundle adherence to the six SSI prevention measures outlined in the Swissnoso SSI Intervention module.

SSI prevention measure adherence data must be linked to patients in the SSI Surveillance module. This is one of the aims of the Swissnoso IPC Platform. Ideally, SSI prevention measure adherence data should be collected automatically for each patient, using data in electronic patient record systems (e.g. timing of antimicrobial prophylaxis, body temperature, glucose levels, *S. aureus* decolonisation, etc.). This will create more reliable data for the purposes of promoting efforts at the hospital level. Data on antimicrobial prophylaxis collected by the SSI Surveillance module must be improved by counting prophylaxis as failed only in cases where it was indicated but not correctly administered.

The new case report forms (from January 2026) will include variables on digestive decontamination before colorectal surgery and ***S. aureus*** decolonisation before arthroplasties, cardiac surgery and spine surgery with implants. Initially this will be on a voluntary basis within a 2-year pilot project starting in 2026. Depending on the results of this pilot, these variables could become mandatory. This change is a preparation for automatised data capture of process quality indicators.

OUTCOME

SSI rates

SSI Surveillance was the first HAI incidence surveillance module introduced in Switzerland. It was developed in Valais and first used in western and southern Switzerland in 1998. The hospitals in Valais, Vaud, Neuchâtel, Fribourg, Jura, Geneva (HUG), Ticino and the Emmental joined the surveillance first. The programme was transferred to Swissnoso in 2010 and became mandatory in 2011 in collaboration with Swiss National Association for Quality Development in Hospitals and Clinics (ANQ). Based on the national quality agreement, each hospital is required to monitor at least three of the above-mentioned types of surgery for adults. Hospitals

must perform surveillance for colon surgery if they offer this procedure but can freely select the other types of surgery. In addition, the monitoring of appendectomies is mandatory for children and adolescents up to the age of 16.

What we observed

Over the years, **SSI rates have significantly decreased for 9 types of surgery** in the overall population of changing hospitals **(Figures 11 and 12)**:

- Appendectomy
  SSIs in appendectomies were exceptionally high in the first two years (with lower hospital participation), followed by a steady decline that stagnated since 2020.
- Gastric bypass surgery
  There was a steep decline in SSI rates in gastric bypass surgery after the first two years with even lower rates in 2021 and 2023.
- Laminectomy with implant
  The extreme drop in SSIs in laminectomies with implant coincided with a drop in surveyed interventions.
- Cardiac surgery
- Colon surgery
- Cholecystectomy
- Hip replacement
- Knee replacement
- Artery surgery of lower limb

Over the years, SSI rates have **not decreased or increased for 5 types of surgery**:

- Cardiac valve implant surgery
  The SSI rate for cardiac surgery with a valve implant decreased to less than half in 2022 versus 2021 without reaching statistical significance but increased again in 2024.
- Rectal surgery
  SSIs in rectal surgery doubled between 2012 and 2020, decreasing sharply to the initial rate in 2022 while maintaining the same number of hospitals but a decreasing number of interventions; however, another 1,5-fold increase occurred in 2024.
- Hysterectomy
  SSIs in hysterectomy have seen an increase in the last 3 years.
- Caesarean section
- Laminectomy without implant

The evolution of deep and organ/space SSI rates follows the SSI rates when superficial SSIs are included.

In 2024, overall, 56.0% of SSIs were detected only after patient discharge; 36.0% of these were superficial, 10.4% deep wound and 53.6% organ/space infections. Data on the proportions of multi-drug-resistant pathogens are available in the dedicated SSI report.

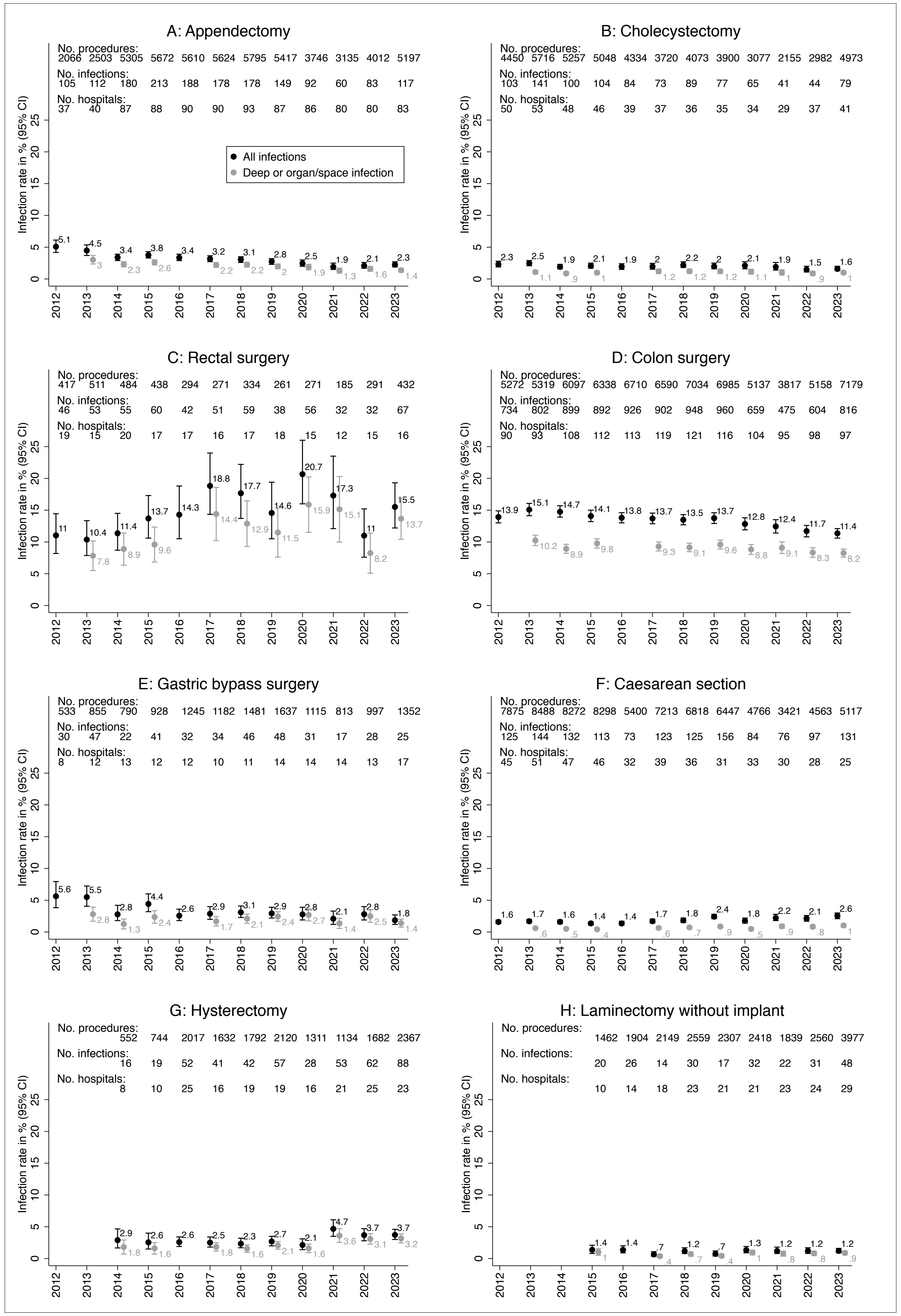


Figure 11. Surgery without implant: surgical site infection rate, 2022–2023.

SSI Surveillance data for the period 1 October 2022 to 30 September 2023.

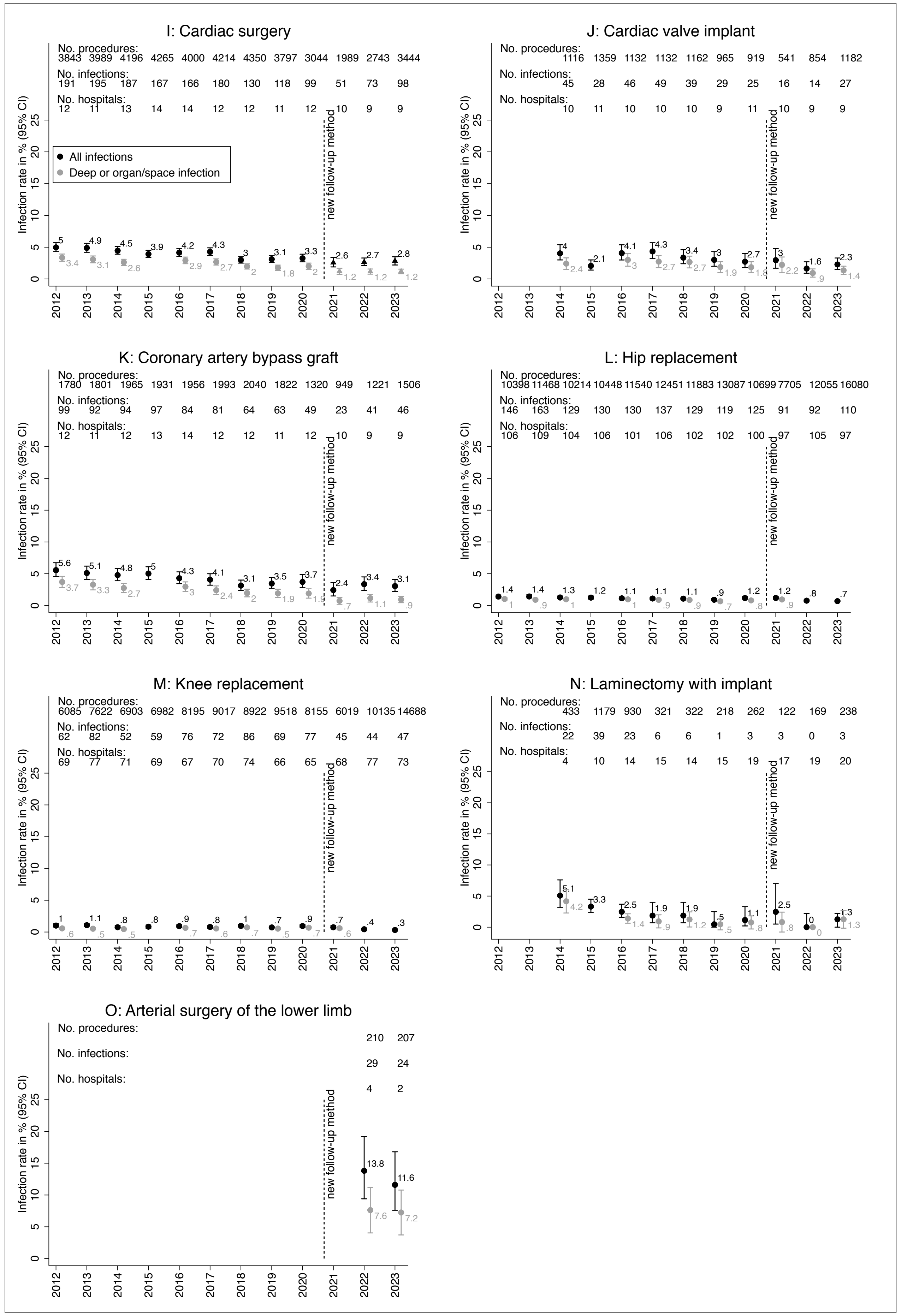


Figure 12. **Surgery with implant: surgical site infection rate.**

SSI Surveillance data for the period 1 October 2022 to 30 September 2023.

What to be aware of

In 2021, the follow-up period for implant surgery (including cardiac surgery because of cerclages) was reduced from one year to three months. This could theoretically lead to an artificial decrease in SSIs from 2022 onwards, as seen in cardiac surgery with implant and laminectomy with implant. The results displayed here are crude SSI rates. They do not account for a changing patient case mix, changes in surgical technique (minimally invasive or robotic surgery) or a shift of surgery to an ambulatory setting. The participation of Swiss hospitals has not changed significantly over time owing to the mandatory nature of the module. However, the number of participating hospitals has declined because of hospital mergers and the closure of smaller hospitals. Except for colon surgery and appendectomy in children, which are mandatory, the choice of additional surgical procedures to include at the hospital level can introduce bias – either positive or negative – into the results at both the hospital and national levels. Allegedly, some of these additional choices are decided by cantonal health authorities.

What it means

SSI rates have decreased significantly over the years for most surgery types and overall. Participation in the Swissnoso Surveillance module can be assumed to have contributed to this successful trend. An alternative interpretation cannot be ruled out, however, since participation in SSI Surveillance is mandatory and comparisons with non-participating Swiss hospitals are thus lacking.

In some cases, prominent patterns (as described above) in SSI rates over time are poorly understood. The steep decline in SSI following rectal surgery is encouraging and might be due to the concentration of rectum surgery in fewer hospitals, since it has been considered a «highly specialised surgery» that only authorised hospitals can perform.

Many hospitals experience such a low number of SSIs per year (owing to a low caseload) that their SSI rates show considerable confidence intervals. This challenges SSI rates as the primary metric to steer improvement initiatives at the hospital level. Process quality indicators (adherence rates) would be more adequate and effective.

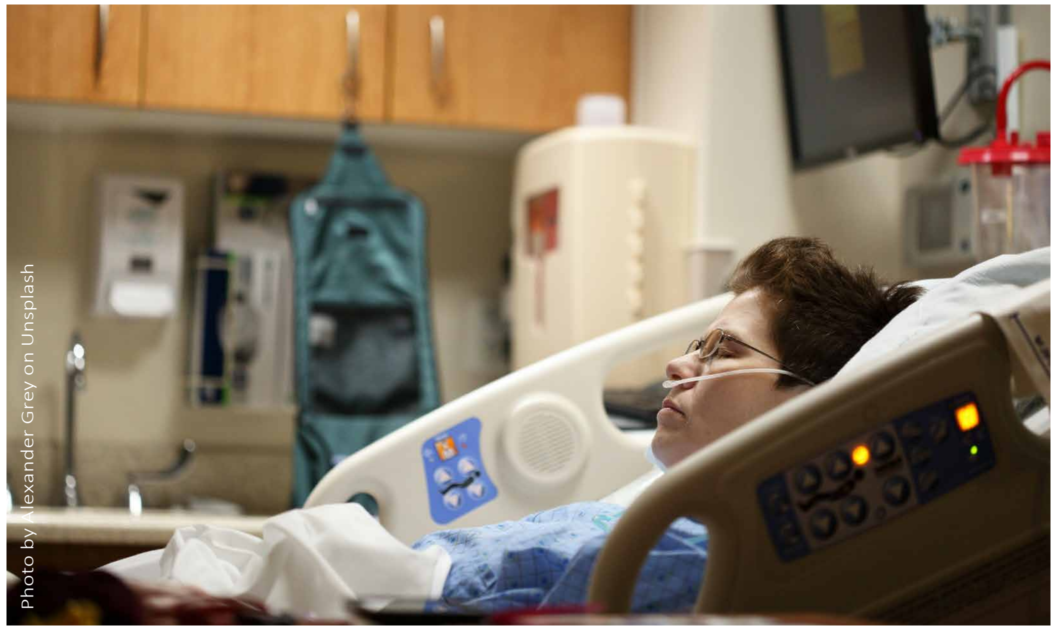
What to do next

We reiterate last year's recommendations to ramp up the Swissnoso SSI Intervention module to advocate for improvement strategies beyond monitoring adherence rates, prioritise those surgery types with increasing or elevated SSI rates and steer improvement initiatives at the hospital level with adherence rates (since SSI rates show overly large confidence intervals).

The planned Swissnoso *IPC Platform* includes a quality improvement project; the plan is to include SSI prevention. This initiative is based on feedback on prevention adherence rates with leadership goal setting. Even if this project only includes a minority of Swiss acute care hospitals, the learnings might allow the intervention to be fostered in parallel.

To find and advise outlier hospitals (over- and under-performers), it is advisable to collate SSIs over several years to counteract the small-number problem.

Considering case-mix adjustment over time would be valuable to better understand the natural trend in SSI rates versus the effect of improvement efforts.



3. Catheter-associated urinary tract infections (CAUTIs)

STRUCTURE

IPC structures for CAUTI prevention

In addition to structural components of CAUTI provided by the Minimum Requirements Survey, the Swissnoso CAUTI modules generate process data (CAUTI intervention) and outcome data (CAUTI surveillance).

What we observed

Of the 96 hospitals that responded to the new *Minimum Requirements Survey* (distributed with the CH-PPS 2024), 51 (53.1%) confirmed the existence of CAUTI prevention guidelines in their hospitals **(Figure 13)**. This is less than in 2022/2023 (71.5%). Only a third of the same 96 hospitals survey their CAUTI rates. The percentage of hospitals is even lower that engage in an intervention to lower CAUTI rates.

In 2024, 3 hospitals started using the Clean Care Monitor (CCM-CAUTI) instrument to observe the preventive quality of catheter insertions.

What to be aware of

Minimum Requirements Survey data from 96 CH-PPS hospitals might be associated with desirability and participation bias. Larger hospitals were over-represented. The reduced availability of guidelines challenges data quality, since hospitals are unlikely to delete existing guidelines.

What it means

The decline in structure quality witnessed in 2024 is unexpected and undesirable.

What to do next

Stimulate quality improvement initiatives in CAUTI prevention in Swiss hospitals. Verify data quality.

PROCESS

Adherence to CAUTI prevention measures

The **CAUTI Intervention module** was introduced in the spring of 2023. It features the use of the CCM-CAUTI to observe the asepsis of urinary catheter insertions. The Swissnoso CAUTI Surveillance module also delivers data on catheter utilisation density and mean duration of catheterisation (proxies for cautionary catheterisation) and the adequacy of the reason for catheterisation (correct indication), extracted from electronically available data.

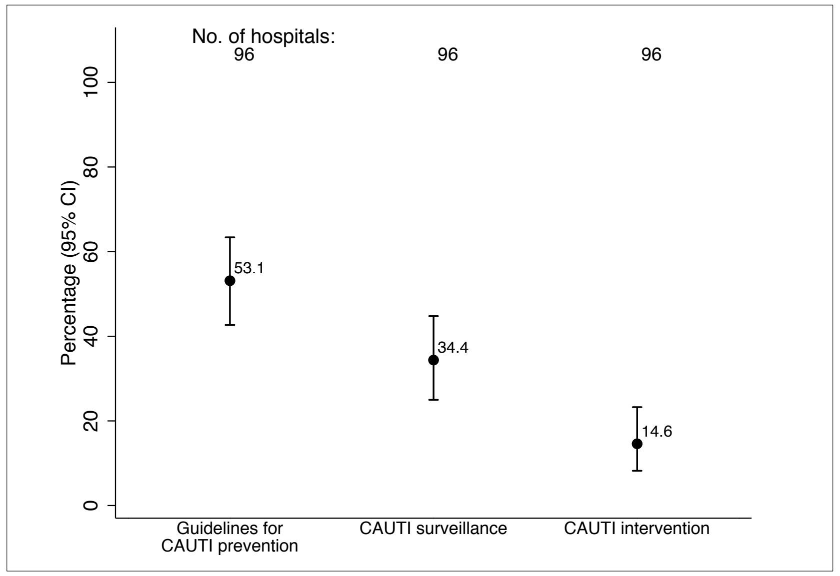


Figure 13. Hospitals reporting on structures related to CAUTI, 2024.

Minimum Requirements Survey (distributed with the CH-PPS 2024).

What we observed

The proportion of justified catheters increased by a few percentage points over the 3 observed years in the subgroup of five hospitals that recorded data on indications continuously (**Figure 14**, grey labels).

The catheter utilisation density increased slightly between 2023 and 2024 in medicine and surgery, massively in ICUs, and decreased in gynaecology/obstetrics **(Figure 15)**. The overall mean duration of catheterisation remained unchanged, coming to 3.82 days in 2024.

What to be aware of

The number of participating hospitals is small and has changed since 2023. The results must therefore be considered with caution to gain a realistic picture of the overall situation in Swiss hospitals.

What it means

Overall, approximately 10% of urinary catheters are still used without a justifiable indication; in internal medicine the percentage is 20%.

The catheter utilisation density continued to increase in some medical specialities between 2022 and 2024, which is undesirable – unless justified by case-mix changes.

The number of participating hospitals is too small to consider the data as nationally representative. It remains to be elucidated why so few IPC teams and hospitals are proactively engaged in CAUTI prevention.

What to do next

It would be desirable for more hospitals to engage in CAUTI prevention to benefit from the preventable proportion. All hospitals should consider automated monitoring of and feedback on process indicators.

OUTCOME

CAUTI rates

The Swissnoso CAUTI Surveillance module was introduced in 2022 after a pilot phase.

What we observed

In 2024, 22 hospitals participated in CAUTI surveillance. These covered 15 surgical, 17 internal medicine, 12 gynaecology/obstetrics, 6 ICU, 5 paediatric, 5 neonatology and 5 rehabilitation units; 4 geriatric and 3 long-term care units were also included. Owing to staggered start dates, 13 hospitals provided partial-year data.

CAUTI rates showed a decreasing trend to 1.12% per 1,000 catheter days **(Figure 16)**, mainly owing to a decline of incidence in internal medicine and to a lesser degree in intensive care medicine.

What to be aware of

A major limitation of the longitudinal data comparison is that the composition of the participating hospitals' overall numbers changed, leading to potential bias. The dataset is (still) too small to draw conclusions on the effect of participating

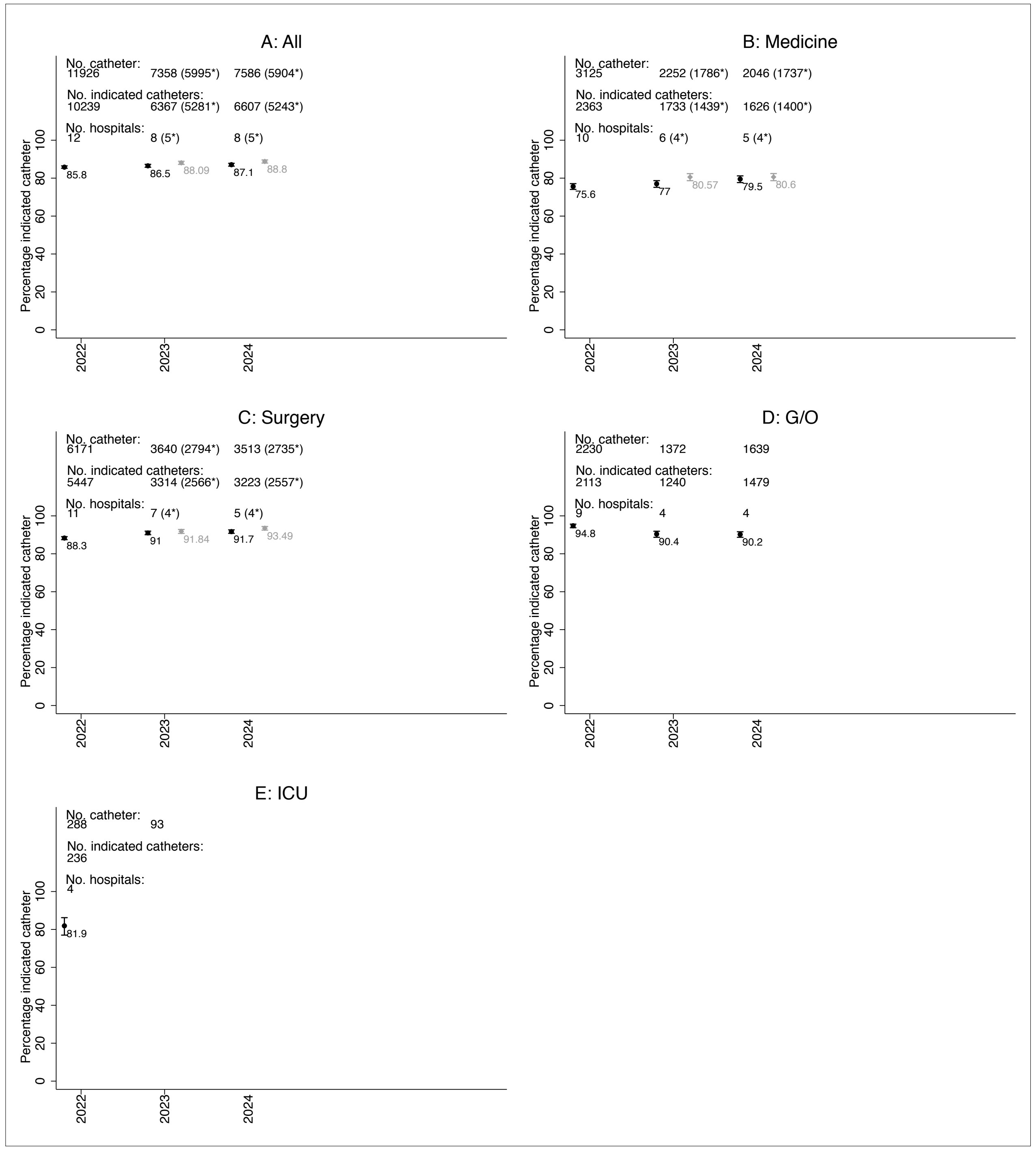


Figure 14. Percentage of indicated catheters based on CAUTI surveillance data.

CAUTI Surveillance data. Numbers in brackets (*) and grey symbols show the numbers from those hospitals that reported data in both years, 2023 and 2024. Data are only displayed if at least four hospitals participated.

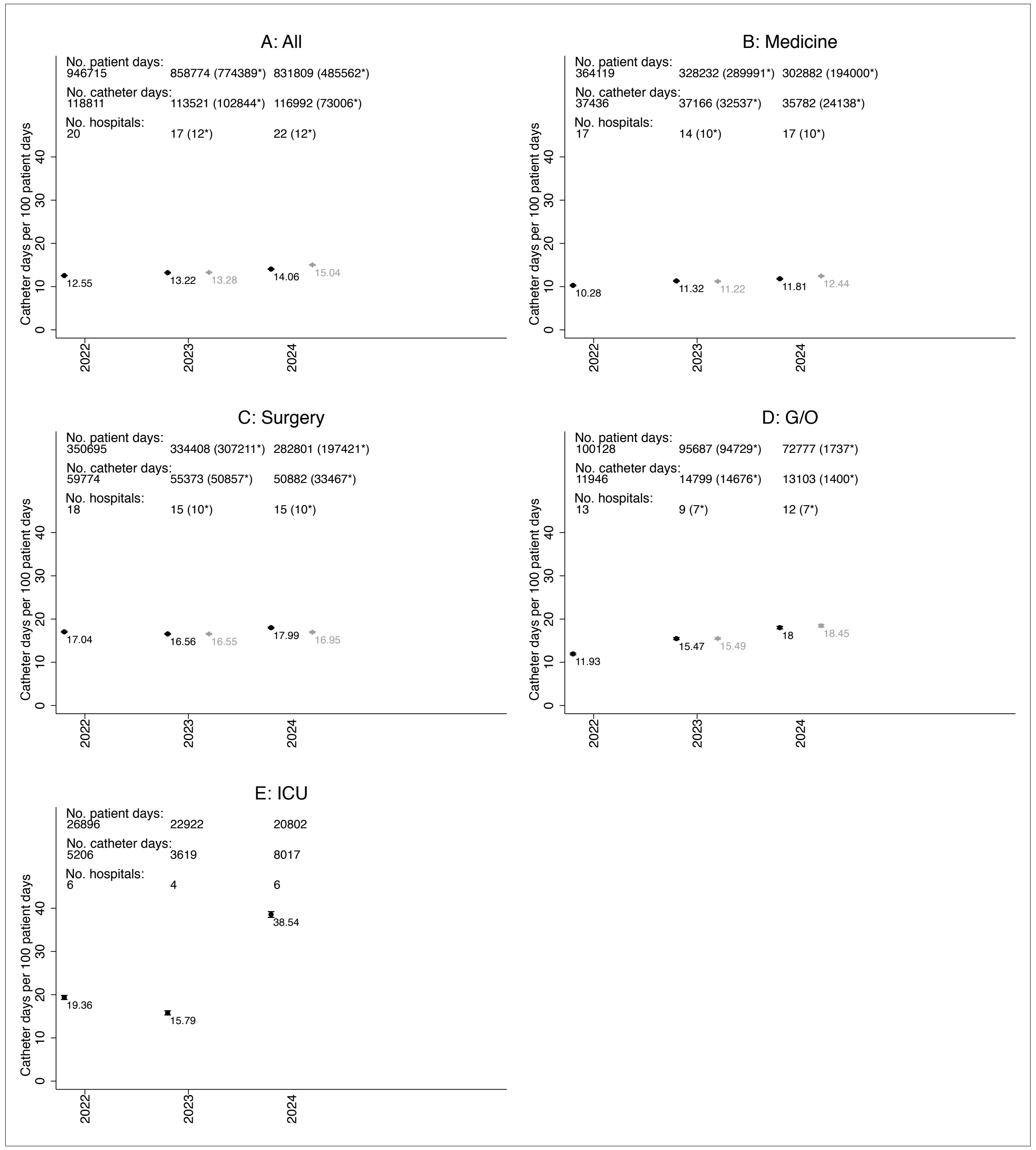


Figure 15. Catheter density based on CAUTI surveillance data.

CAUTI Surveillance data. Numbers in brackets (*) and grey symbols show the numbers from those hospitals that reported data in both years, 2023 and 2024. Data are only displayed if at least four hospitals participated.

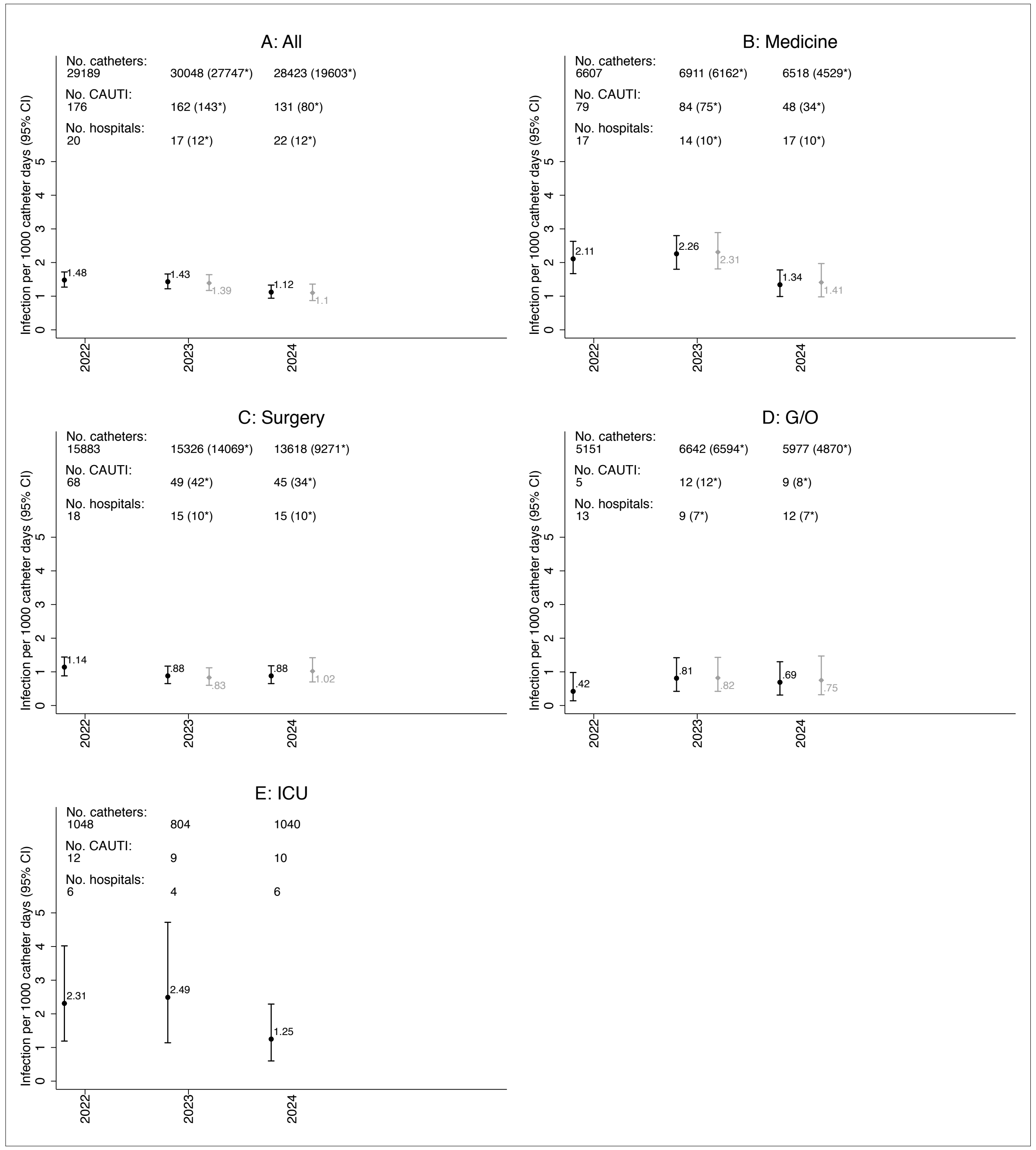


Figure 16. CAUTI infections per 1,000 catheter days based on the CAUTI surveillance.

CAUTI Surveillance data. Numbers in brackets (*) and grey symbols show the results from hospitals reporting data for both years, 2023 and 2024. Data are only displayed if at least four hospitals participated.

in the CAUTI Intervention module (3 hospitals). Additionally, we do not have reliable information on what promotional activities are undertaken by hospitals not participating in the Swissnoso CAUTI Intervention module but still contributing to the Swissnoso CAUTI surveillance. Catheter utilisation density depends on the type of medical care and, therefore, naturally differs between specialities. The proportion of urinary catheters with an established indication might be overestimated, since «urine output monitoring», one of the accepted reasons for catheterisation, might be chosen too liberally (anecdotal information).

With only 22 hospitals participating in CAUTI surveillance and an underrepresentation of Western and an overrepresentation of Southern Swiss regions, the data are not fully representative for Swiss acute care settings.

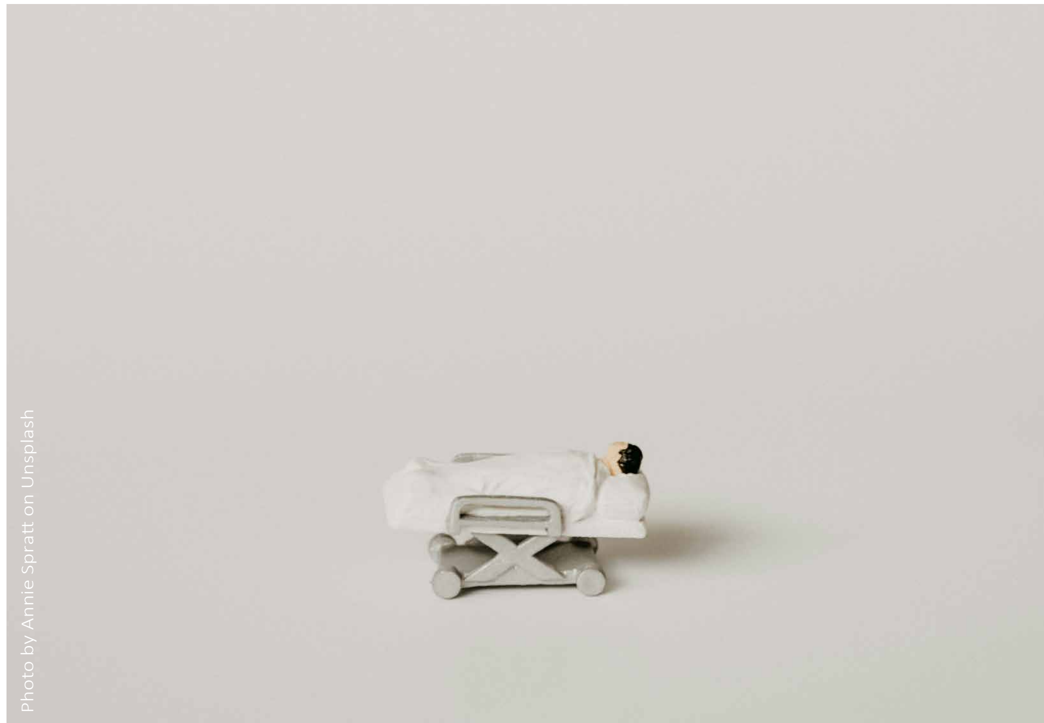
What it means

The 2024 CAUTI rate in the Swissnoso CAUTI Surveillance module of 1.12 per 1.000 catheter days is lower than in 2022 (1.43) and approaches the level reported in a 2021 US study (0.9), which was referenced in the previous annual report.

The annual number of CAUTIs in most hospitals is too low to serve as a steering quality indicator for preventive interventions.

What to do next

The central pillar of CAUTI prevention remains the restrictive use of urinary catheters. Swissnoso collects the process indicators «indication», «mean duration of catheterisation» and «catheter utilisation density», which best represent these process qualities. These indicators should be used to drive and monitor improvement at the hospital level. The notion of device stewardship serves as a means of reducing overall morbidity and mortality due to HAI and other device-associated complications.



4. Antimicrobial resistance (AMR)

Preventing and mitigating AMR is closely linked to effective infection prevention and control (IPC). Under the framework of the **National Strategy on Antimicrobial Resistance (StAR)**, Swissnoso and its six partner organisations, the Swiss Society for Infectious Diseases (SSI), the Swiss Society for Hospital Hygiene (SSHH), the Swiss Association of Public Health and Hospital Pharmacists (GSASA), the Swiss Society for Microbiology (SSM), ANRESIS, and the Swiss Medical Association (FMH), continue to support the implementation of antimicrobial stewardship programmes (ASPs) in Swiss acute care hospitals through the StAR-3 project.[1]

Swissnoso has three data sources that are relevant for this 2024 report:

1) CH-PPS for the prevalence of patients under antimicrobial treatment[2]

2) the CH-PPS *Minimum Requirements Survey* (distributed with the CH-PPS) for structure[3]

3) exceptionally for 2024, the 2024 StAR-3 *Project Survey on Antimicrobial Stewardship* determining the status of antimicrobial stewardship implementation in Swiss hospitals, conducted between October 2024 and January 2025 **(Annex 3)**[4]

In addition, information relevant to AMR prevention and mitigation is issued by StAR, Swissnoso's National Nosocomial Outbreak Investigation Centre[5] and ANRESIS,[6] providing critical insights to support national AMR strategies.

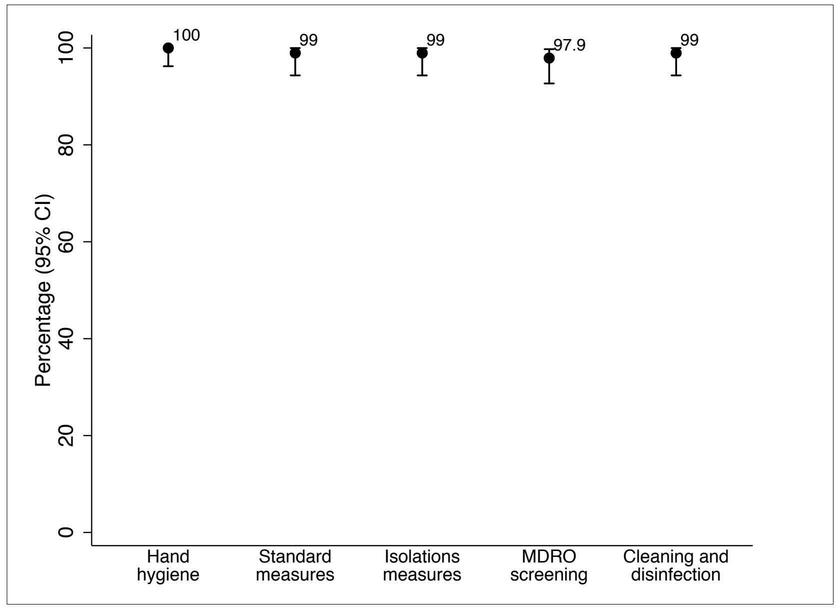


Figure 17. Percentage of hospitals providing guidelines relevant to antimicrobial resistance (n=96), 2024.

Minimum Requirements Survey (distributed with the CH-PPS 2024).

1 StAR-3 (Swissnoso and partner organisations). Full information available here: https://www.swissnoso.ch/forschung-entwicklung/umsetzung-star/star-3-antimicrobial-stewardship-programs-for-swiss-hospitals

2 CH-PPS 2024: https://www.swissnoso.ch/module/punktpraevalenz-erhebung-hai/resultate

3 Minimal Requirements Survey: https://www.swissnoso.ch/forschung-entwicklung/strukturelle-mindestanforderungen-hai/ueber-die-strukturellen-mindestanforderungen

4 Project StAR-3 Implementing Antimicrobial Stewardship Programmes in Acute Care Hospitals in Switzerland Monitoring Exercise 2024 https://www.swissnoso.ch/fileadmin/swissnoso/Dokumente/5_Forschung_und_Entwicklung/3_Umsetzung_StAR/StAR_3/250516_Monitoring_2024_Summary.pdf

5 2024 Update by the Swissnoso National Nosocomial Outbreak Investigation Centre on the spread of vancomycin-resistant Enterococcus faecium (VRE) vanA ST612 https://www.swissnoso.ch/news/detail/vre-vana-st612

6 Swiss Antibiotic Resistance Report 2024. Usage of Antibiotics and Occurrence of Antibiotic Resistance in Switzerland. (available on 18.11.2024) https://www.anresis.ch/publications/swiss-antibiotic-resistance-report-2024-usage-of-antibiotics-and-occurrence-of-antibiotic-resistance-in-switzerland-available-on-18-11-2024/
https://www.anresis.ch/wp-content/uploads/2024/11/SARR24.pdf

STRUCTURE

Structures for the prevention of antimicrobial resistance

In 2024, data on structural implementation of antimicrobial stewardship were collected through the *Minimum Requirements Survey* (distributed with the CH-PPS 2024; **Annex 1**) and the *2024 StAR-3 Project Survey on Antimicrobial Stewardship* **(Annex 3)**. The latter focused specifically on the implementation of antimicrobial activities and antimicrobial stewardship programmes, with 69 of the 136 invited hospitals participating.

What we observed

According to the *Minimum Requirements Survey*, the availability of relevant guidelines in participating hospitals is high **(Figure 17)**, while 99% of hospitals conducted multidrug-resistant microorganisms (MDRO) screening, 83% compiled microbiology statistics and 25% had an outbreak strategy and/or shared MDRO information during patient transfers (data not shown). Monitoring hand hygiene by direct observation was conducted in 90% of hospitals and *Clostridioides difficile* surveillance in 74% (data not shown).

A total of 68 of the 142 hospitals invited (47%) responded to a Swissnoso survey on the level of implementation of the Swissnoso guidelines relating to the control of MDRO in Swiss acute care hospitals.

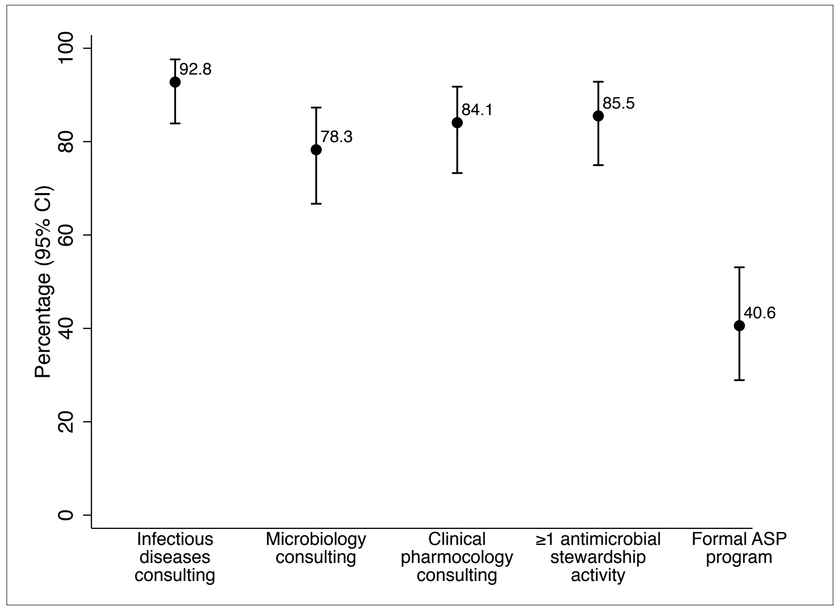


Figure 18. Percentage of hospitals reporting antimicrobial stewardship structures (n = 69), 2024.

2024 StAR-3 Survey on Antimicrobial Stewardship.

Overall adherence with national recommendations for on-admission screening across the five MDRO targets was 69% (weighted score; interquartile range [IQR], 55–86%).

According to the 2024 StAR-3 S*urvey on Antimicrobial Stewardship*, 40% of hospitals had a formal antimicrobial stewardship program (ASP) in place, while 86% declared at least one ASP activity (**Figure 18)**. Support by infectious diseases consulting and other specialised consulting services was relatively widespread **(Figure 18)**.

Among hospitals declaring at least one activity, written guidelines and monitoring antimicrobial use are prevalent, while HCP education and restrictions on antimicrobial use are implemented to a much lesser degree – especially when considering that these results concern only hospitals with at least one activity **(Figure 19)**. When considering all respondents, percentages are approximately 5% lower.

What to be aware of

Minimum Requirements Survey data from 96 CH-PPS hospitals (overrepresenting larger hospitals) and *2024 StAR-3 Survey on Antimicrobial Stewardship* with 69 hospitals might be associated with desirability and participation bias.

What it means

About two-thirds of Swiss hospitals report having antimicrobial use guidelines and monitor consumption via the ANRESIS network, aligned with their IPC infrastructure. However, significant gaps remain: around one-quarter lack comprehensive antimicrobial stewardship guidelines, including surgical prophylaxis. Education for new staff, prescription audits and structured feedback are implemented inconsistently and represent the weakest areas. As in other high-income countries, the shift from structural readiness to outcome-oriented antimicrobial stewardship remains difficult. Dedicated staff, leadership support and interdisciplinary collaboration – key enablers of effective antimicrobial stewardship – are still underdeveloped, according to these sources.

What to do next

Hospitals should make use of the national ASP implementation handbook (StAR-3, 2024) and prepare for its second edition, expected in 2026, which will offer updated tools and guidance based on practical experience. Key priorities include expanding participation in ANRESIS, strengthening audit and feedback systems, and institutionalising staff education on antimicrobial use.

For Swissnoso and StAR-3

- Finalise and disseminate the second edition of the ASP handbook by 2026.
- Support healthcare professionals with training and practical resources.
- Promote leadership engagement, staffing and inter-hospital collaboration.
- Launch a follow-up national monitoring survey (2026–27) to evaluate progress in ASP implementation.
- Integrate findings from research projects like REVERSE to align with international best practices.[7]

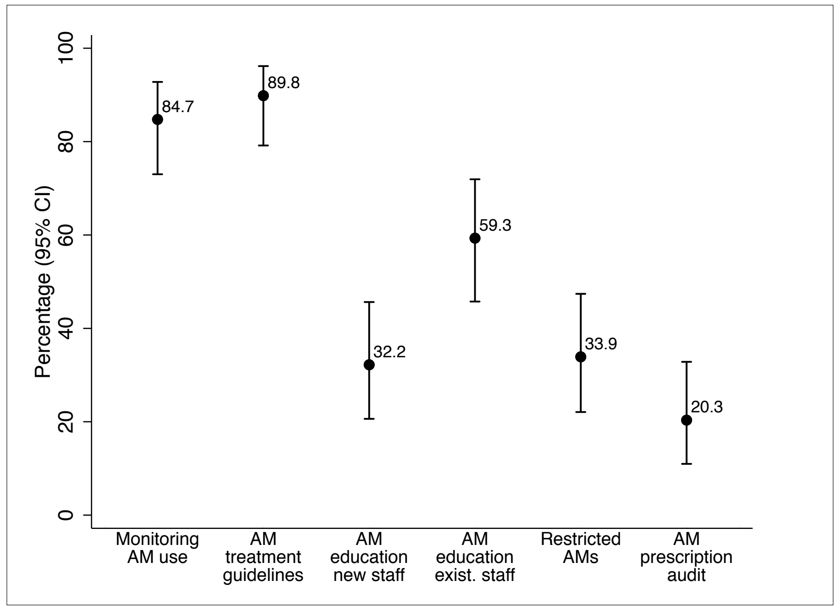


Figure 19. Proportion of antimicrobial stewardship activities implemented in hospitals declaring any antimicrobial (AM) stewardship activity (n = 59), 2024.

2024 StAR-3 Survey on Antimicrobial Stewardship. The percentages in this graph refer not to all responding hospitals but only to those declaring at least one of these activities.

7 REVERSE project: https://reverseproject.eu

For FOPH and national stakeholders

- Advance strategic policies that mandate or incentivise ASP adoption.
- Secure sustainable funding and resources for implementation.
- Improve data sharing to support benchmarking and alignment between national guidance and local practice.

PROCESS

Swissnoso has process metrics for AMR based on CH-PPS.

Antimicrobial use

What we observed

Patients receiving any type of systemic antimicrobial medication on the day of the CH-PPS account for slightly over one-third of all included patients **(Figure 20)**. Medium-sized, private for profit, and speciality hospitals display a higher proportion of patients on antimicrobials **(Figure 21)**.

The prevalence of patients on antimicrobials saw a statistically significant increase between 2023 and 2024, up by 3 percentage points, translating to an increase of approximately 10% **(Figure 22)**. Antimicrobial use prevalence shows an interesting pattern between indications and hospital size: medium-sized hospitals displayed the highest prevalence of antimicrobial use, while smaller hospitals reported the highest rates of surgical prophylaxis **(Figure 22)**.

What to be aware of

In 2024, antivirals were included in the antimicrobials, which might contribute to the observed increase.

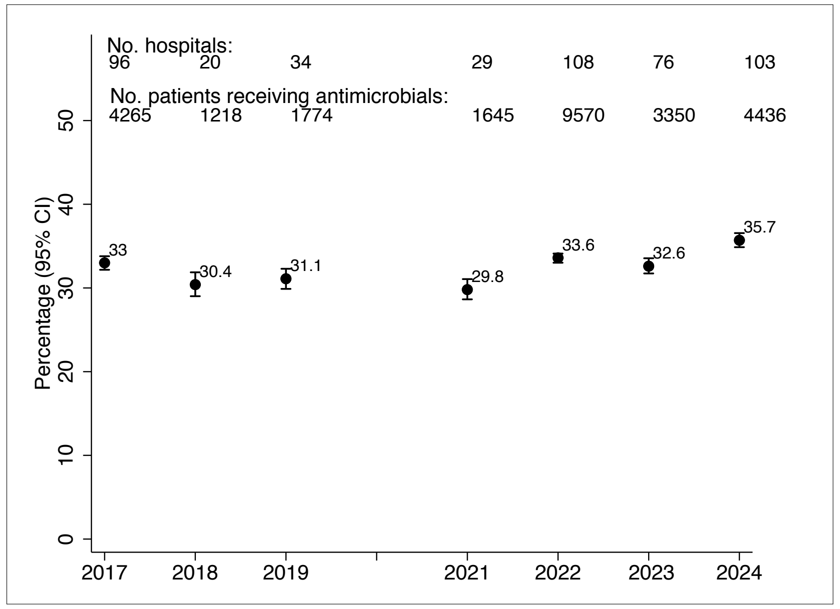


Figure 20. Prevalence of antimicrobial use over time in all hospitals.

CH-PPS 2024. Proportion of hospitalised patients receiving antimicrobials.

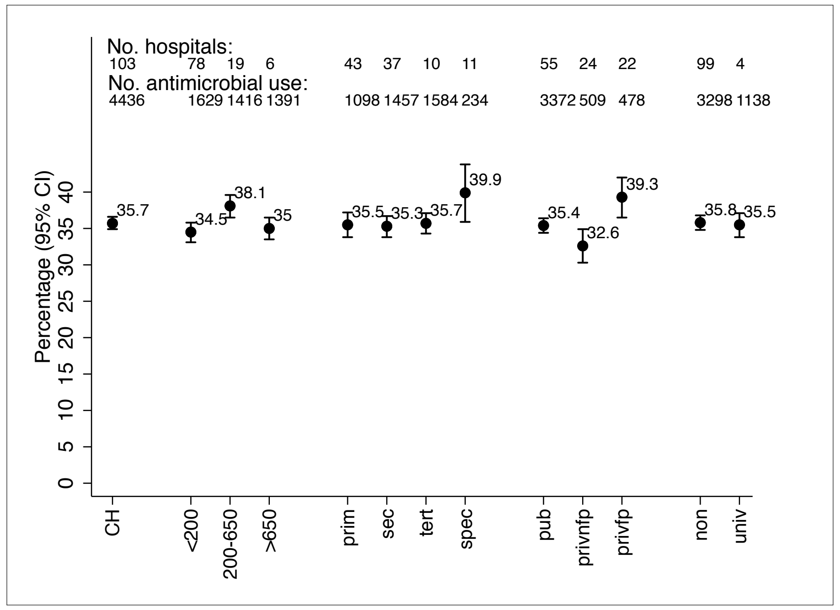


Figure 21. Antimicrobial use by hospital size, hospital type and university affiliation, 2024.

CH-PPS 2024. Proportion of hospitalised patients receiving antimicrobials with any indication (therapeutic or prophylactic). CH: Switzerland; hospital size: <200 beds (small), 200-650 beds (medium size), >650 beds (large); hospital type: primary care, secondary care, tertiary care, specialised hospital, paediatric clinics are not shown; hospital ownership: pub (public), privnfp (private, not-for-profit), privfp (private, for-profit); University-affiliation: not affiliated (non), affiliated (univ).

What it means

The observed differences in antimicrobial use prevalence between different hospital types are noteworthy. Given the less severe overall case mix, one would expect lower use in smaller hospitals, speciality and for-profit hospitals. More detailed data are necessary to understand the case-by-case justification for this phenomenon.

What to do next

We recommend discussing whether antiviral treatment (newly included this year) should be reported separately from antibacterial treatment to be able to show the evolution of antimicrobial use over the years. Further information is needed regarding the use of surgical prophylaxis.

Given that in- and outpatient surgeries are subsidised equally under the new regulations, we expect a shift towards outpatient surgery for patients at a low risk of complications. In this situation, an electronic add-on for the TARDOC 2026 would constitute a solution to keep track of outpatient antimicrobial use among surgical patients.

Hand hygiene

Hand hygiene is regarded as the most effective means of mitigating pathogen transmission within healthcare settings. Therefore, it is a good process indicator of the prevention of between-patient spread of susceptible and MDRO (besides architectural configurations and environmental source control and cleaning).

Many hospitals collect hand hygiene data using the Swissnoso CCM-CleanHands mobile observation tool, which was introduced in 2012.[8] The instrument supports observation according to the WHO's My Five Moments for Hand Hygiene concept and method.

A four-moment concept is also available. It includes an additional indication of «Before touching the patient's immediate environment», merging it with «Before touching a patient» to constitute Moment 1, and merging «After touching the patient's immediate environment» with «After touching the patient» as Moment 4.

Additionally, the correct use of gloves can be monitored (data not shown in this report).

What we observed

Overall hand hygiene adherence showed a peak in 2020 – the initial year of the COVID-19 pandemic – and since then has seen a steady year-by-year decline, which came to 5–10% in 2024 **(Figure 23)**.

Interestingly, in the 12 hospitals using the 4-moment concept, the doctors surpassed nurses for the first time in most ‹moments›, while this is not the case among the much larger number of hospitals using the original WHO 5-moment concept **(Figure 24)**.

The decline since the pandemic is most pronounced in the ‹others› group of HCPs. Here too, a difference between 4-moment and 5-moment hospitals is visible.

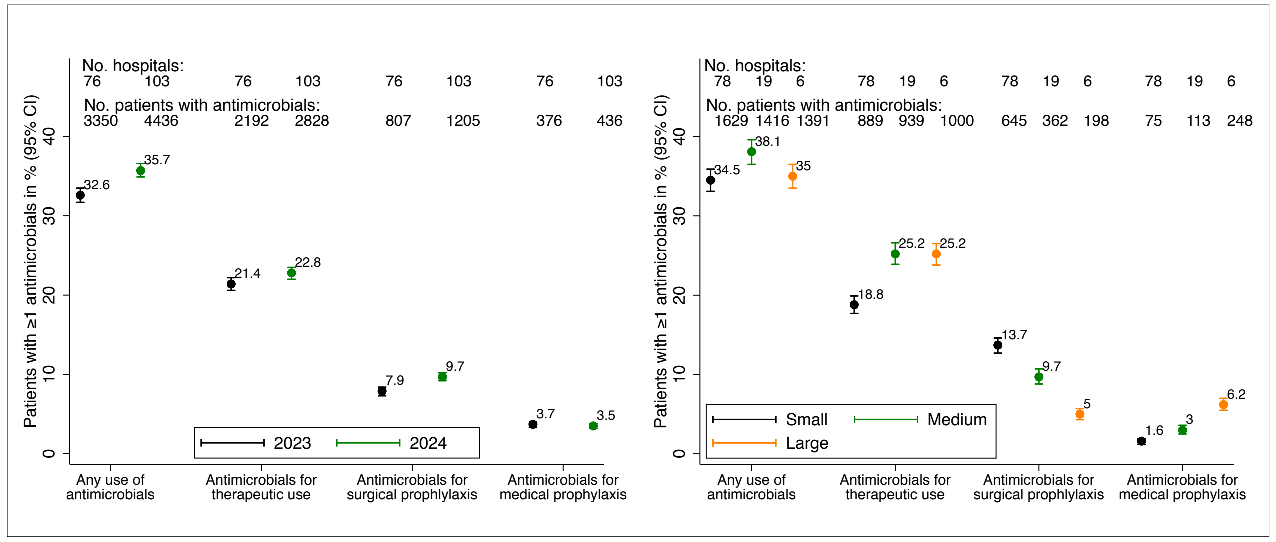


Figure 22. Indication of antimicrobial use.

CH-PPS 2024. Indications of antimicrobial use evolution (2024 and 2023; left graph) and by hospital size (2024; right graph).

8 Swissnoso Clean Hands module: https://www.swissnoso.ch/module/ccm-cleanhands/ccm-cleanhands/das-modul

What to be aware of

Owing to the large number of individual observed hand hygiene moments, small changes in adherence over time or between indications become statistically significant, even when irrelevant for the transmission risk.

The well-known biases apply to non-randomised, manual observations with the observer noticeable by HCPs.

The instrument does not capture HCP identity and individual-level data, which precludes clustering correction at the HCP level (design effect). Moreover, pooled mean hand hygiene adherence might not reflect the true risk of hand transmission in a unit, since a single HCP with very low hand hygiene but frequent contact with changing patients could result in a high rate of transmission. We know that this situation is common in epidemic pathogen transmission (high-spreader cluster patterns).

What it means

The observed decline in hand hygiene adherence is noteworthy. It is possible that the perception of infectious risk during the pandemic stimulated better hand hygiene, which then diminished as the impact of SARS-CoV-2 waned.

Equally noteworthy is the distinct profile of the 12 hospitals using the 4-moment concept, especially with doctors having surpassed nurses in terms of adherence.

What to do next

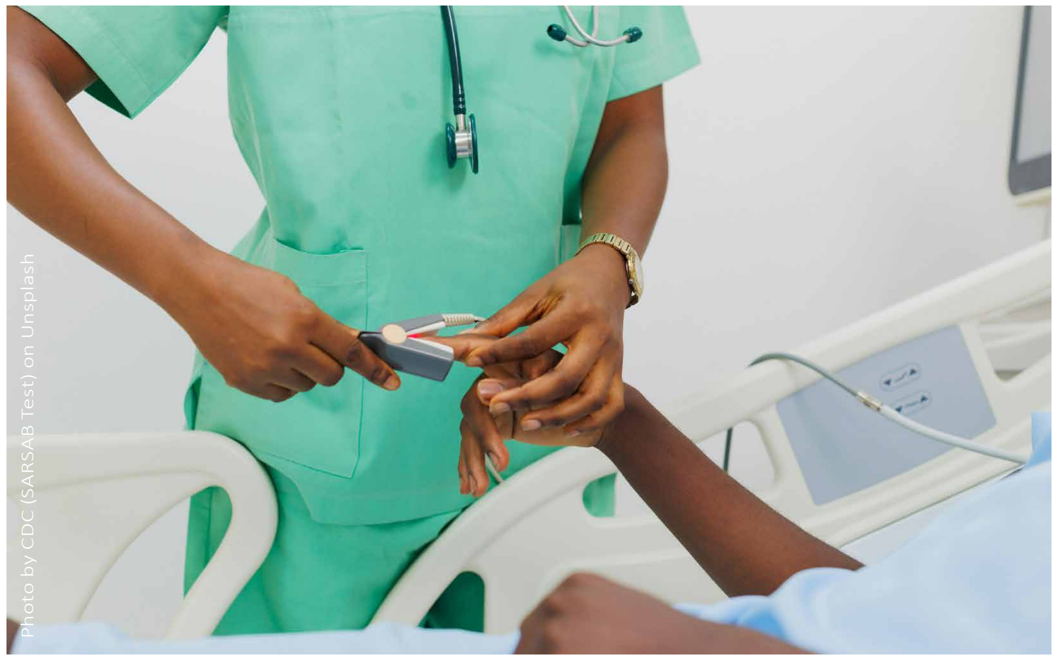
Last year we recommended reflecting on the possibility of limiting hand hygiene to moment 1 ‹before touching a patient› and collecting these data automatically 24/7 by means of an electronic system – with anonymous identification of HCPs and patients – as a better indicator of patient exposure to microbial transmission. This reflection is still pending – and might be best addressed within the Swissnoso-EQK digital and quality improvement project.

OUTCOME

The *Update on the emergence and rapid inter-regional spread of vancomycin-resistant Enterococcus faecium (VRE) vanA ST612 in Switzerland* report shows ongoing transmission in a major cluster in Switzerland.[9]

According to CH-PPS data, the proportion of resistant variants in pathogens in HAIs has increased in enterococci (vancomycin resistance, VRE), and *Pseudomonas aeruginosa* (carbapenem resistance, CRPA) from 2017 (difference between 2017 to 2024 for CRPA 20% (CI: 0,8–40,0%); for VRE 6,8% (CI: -1,0–14,7%)), but the percentages of other AMR pathogen have remained stable.

More detailed data on AMR outcomes are published in dedicated reports by ANRESIS[10] and StAR.



9 VRE vanA ST612 – Update 31.5.2024: https://www.swissnoso.ch/news/detail/vre-vana-st612
10 Swiss Antibiotic Resistance Report 2024: https://www.anresis.ch/wp-content/uploads/2024/11/SARR24.pdf

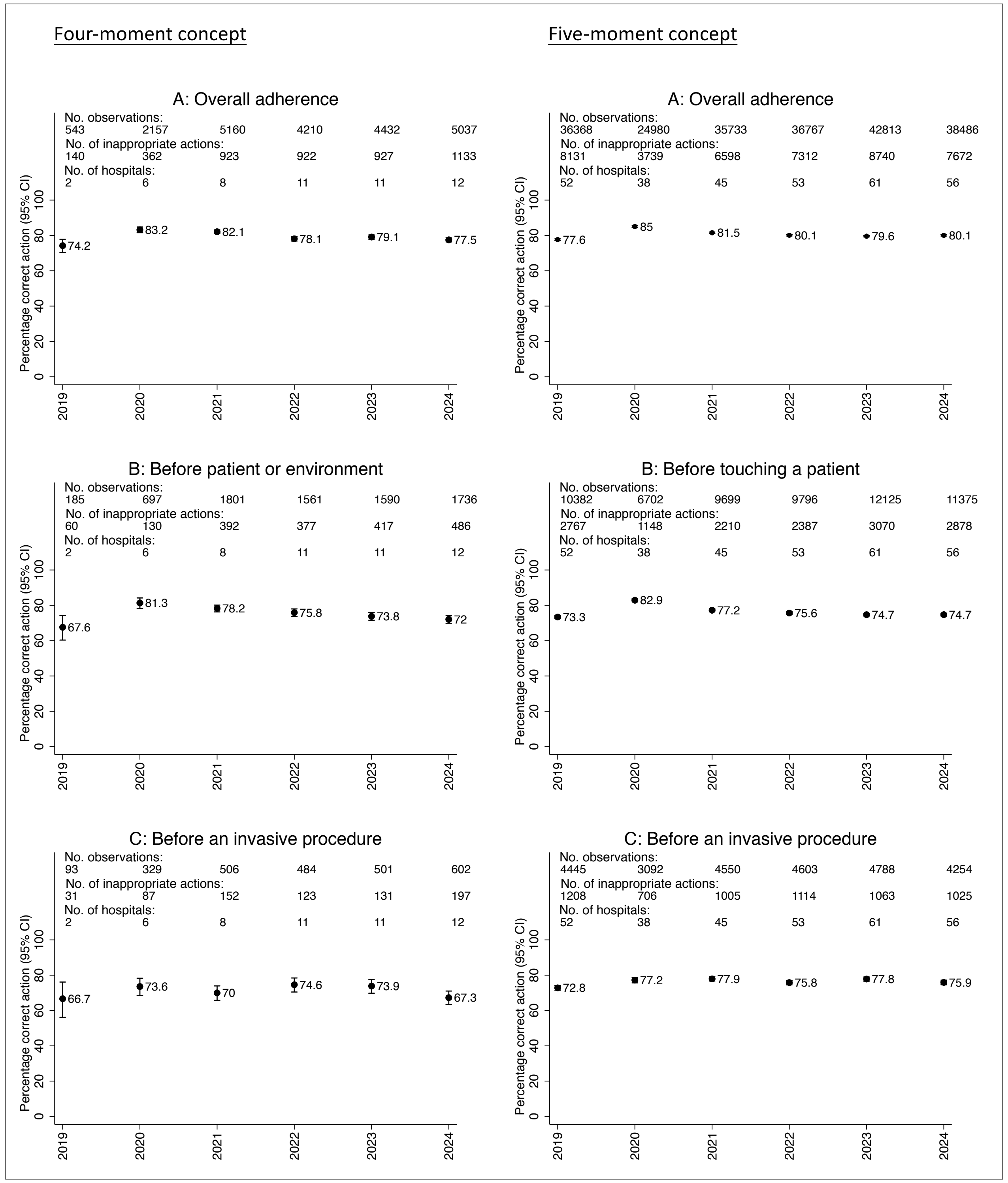


Figure 23. Results of monitoring hand hygiene with the CCM-CleanHands tool.

CCM-CleanHands. Only hospitals with one hundred or more observations per year on the inpatient ward were included. Observations during operations were excluded. The left panel shows the observations according to the four-moment concept, and the right panel according to the five-moment concept.

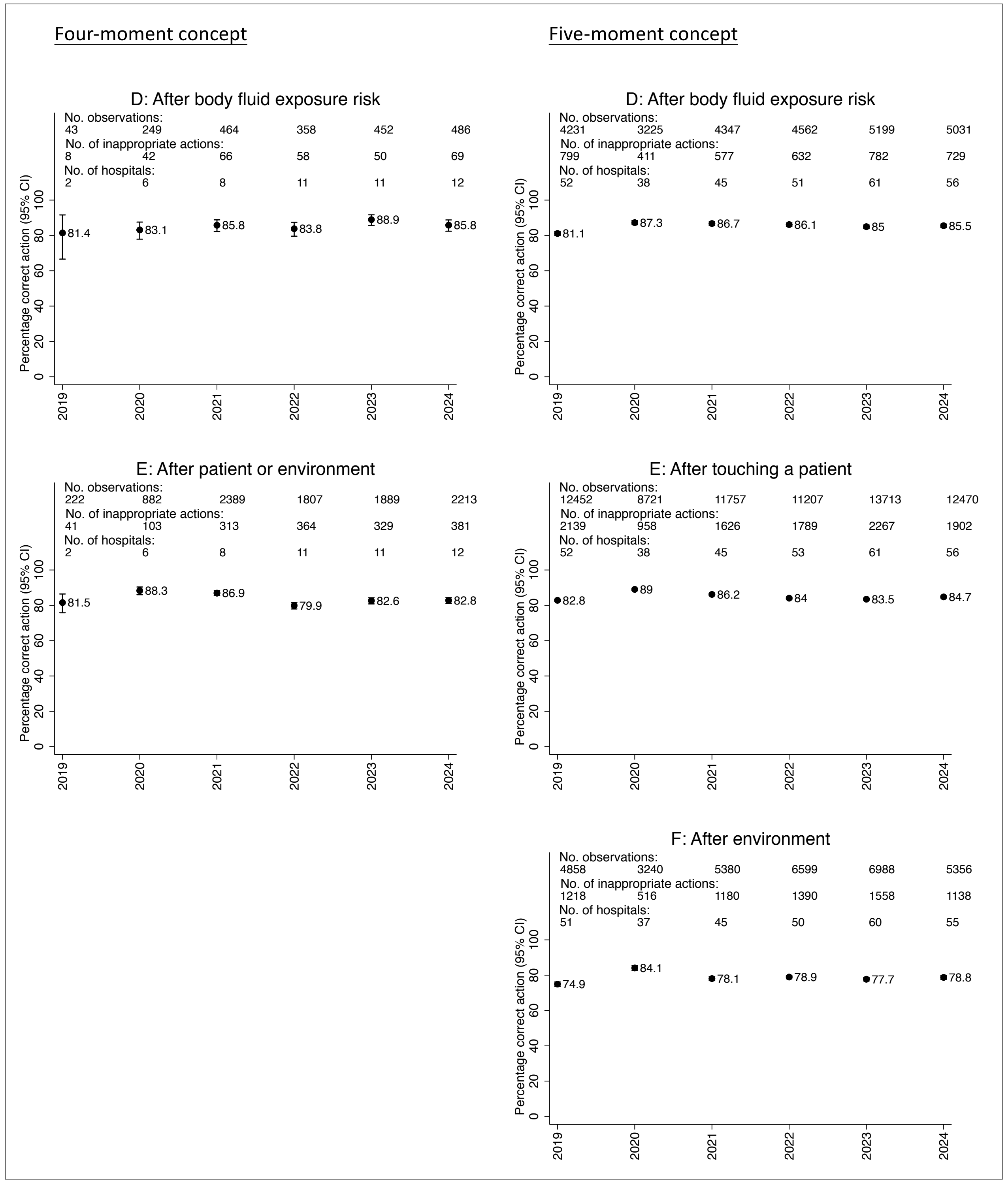


Figure 23. (continued).

Results of monitoring hand hygiene with the CCM-CleanHands tool. *See caption on previous page for description.*

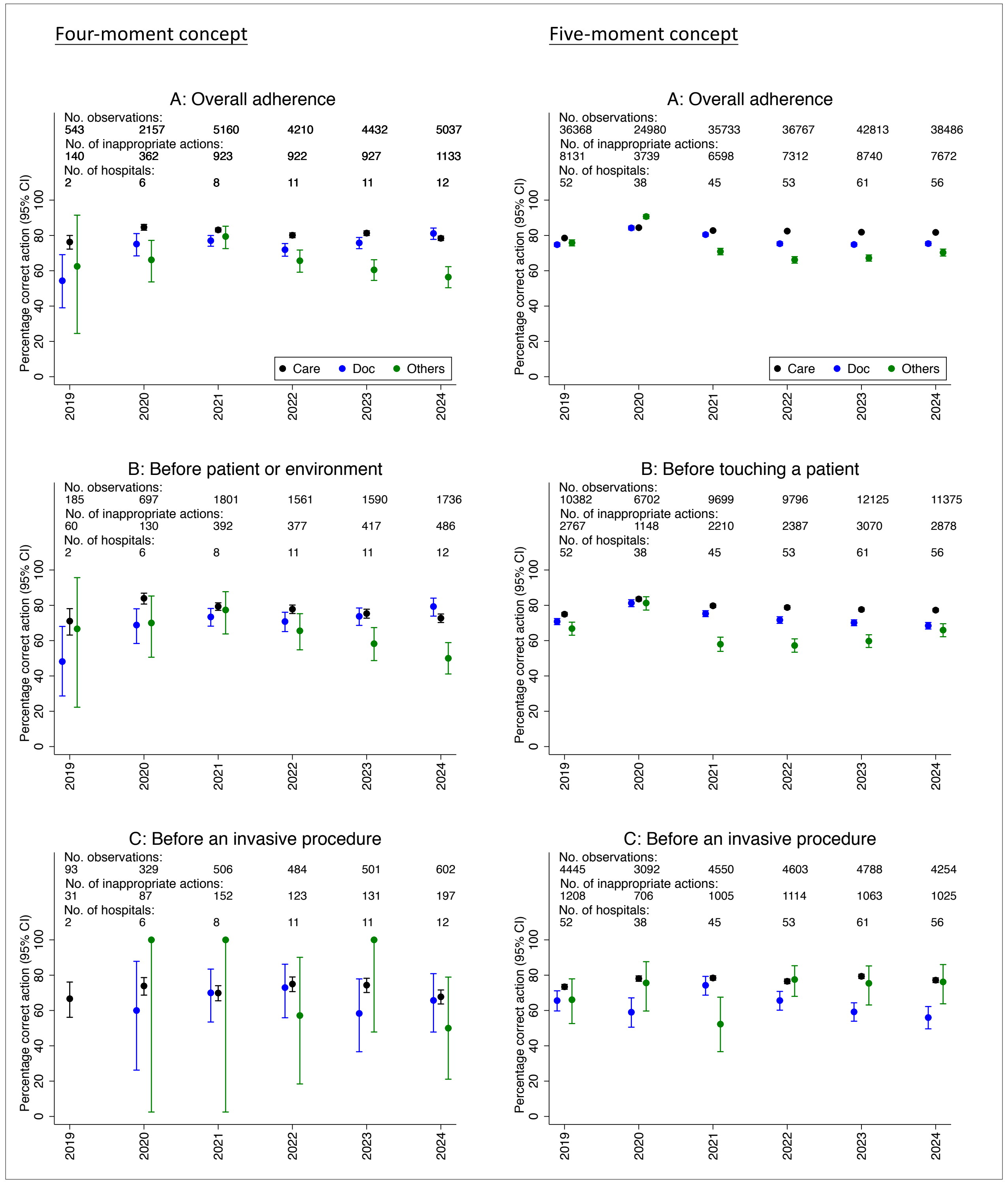


Figure 24. Evolution of hand hygiene adherence with the CCM-CleanHands tool stratified by profession.

CCM-CleanHands. Only hospitals with one hundred or more observations per year on the inpatient ward were included. Observations during operations were excluded. The left panel shows the observations according to the four-moment concept, and the right panel according to the five-moment concept.

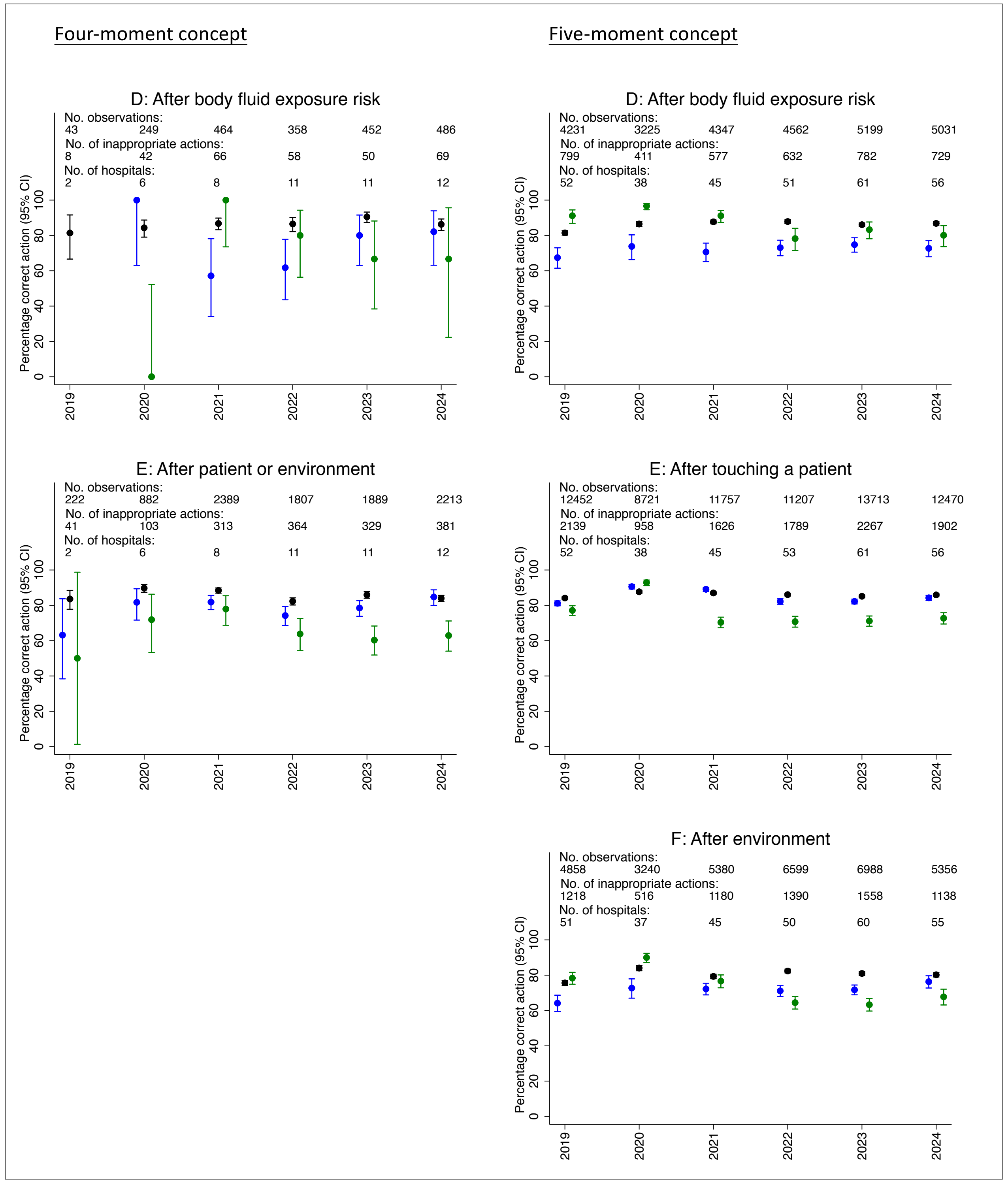


Figure 24. (continued).

Results of monitoring hand hygiene with the CCM-CleanHands tool. *See caption on previous page for description.*

4. Antimicrobial resistance (AMR)

Abbreviations

AMR	Antimicrobial resistance
ANQ	Swiss National Association for Quality Development in Hospitals and Clinics
ANRESIS	Swiss Centre for Antibiotic Resistance
ASP	Antimicrobial stewardship programme
AU	Antimicrobial use
CAUTI	Catheter-associated urinary tract infection
CCM	Swissnoso Clean Care Monitor measurement tool for IPC interventions
CH-PPS	Swiss Point Prevalence Survey
CLABSI	Central line-associated (bloodstream) infection
COVID-19	Coronavirus disease 2019
CRE	Carbapenem-resistant Pseudomonas aeruginosa
ECDC	European Centre for Disease Prevention and Control
EQK	Federal Quality Commission
FOPH	Federal Office of Public Health
FSO	Federal Statistical Office
IPC	Infection prevention and control
HAI	Healthcare-associated infection
HCP	Healthcare professionals
MDRO	Multidrug-resistant organism
NOSO	National Strategy for the Monitoring, Prevention and Control of HAIs
QI	Quality improvement
SARS-CoV-2	Severe acute respiratory syndrome coronavirus 2
SIRIS	Swiss National Joint Registry
SSI	Surgical site infection
StAR	Strategy on Antibiotic Resistance
StAR-3	Swissnoso and partner organisation consortium to support the implementation of antimicrobial stewardship programmes (ASPs) ein Swiss acute care hospitals
VRE	Vancomycin-resistant enterocci (VRE)
WHO	World Health Organization

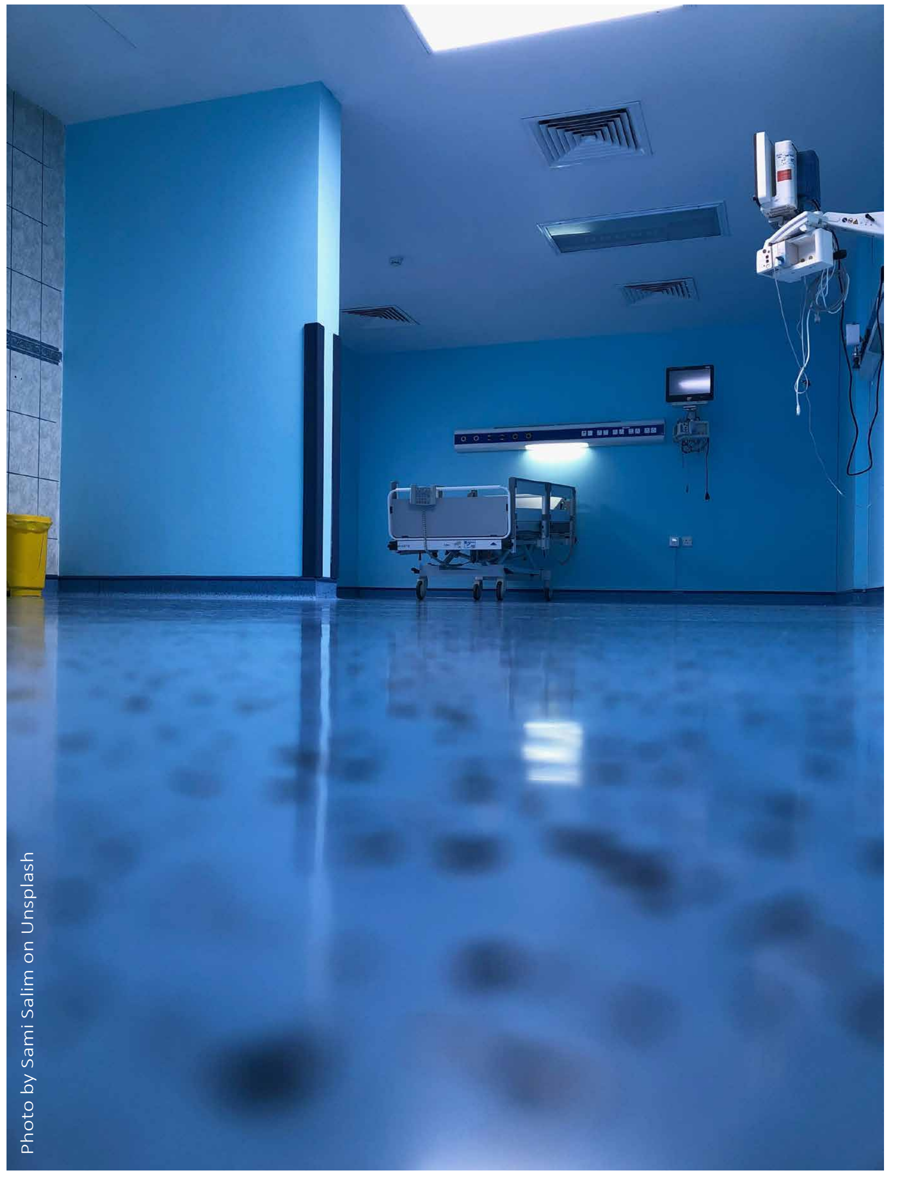


Photo by Sami Salim on Unsplash

Annexes

Annex 1: Minimum Requirements Survey

Self-evaluation questionnaire: structural minimum requirements for HAI prevention and control

Version 1.0: February 2024 [1]

The WHO Infection Prevention and Control Assessment Framework (IPCAF) was previously translated and adapted for use in Switzerland as part of earlier CH-PPS surveys. However, it was not fully aligned with the Swiss national minimum standards. Therefore, the 2024 *Minimum Requirements Survey* (distributed with the CH-PPS 2024) was developed as a more focused tool to assess adherence to the seven key components of the Swiss minimum standards

The self-evaluation tool features 7 key components:

Policies and Procedures: Availability and institutional endorsement of IPC guidelines.

Materials and Equipment: Access to alcohol-based hand rub, protective equipment and waste management.

IPC Organisation and Staffing: Presence of IPC teams, expert staffing ratios, and institutional support.

Task-based Training: Onboarding and continued education for healthcare personnel on IPC topics.

Audits and Monitoring: Implementation of hygiene audits and result reporting mechanisms.

Surveillance and Outbreaks: Data collection on HAI indicators and MRE protocols.

Interventions: Implementation of at least one approved intervention module (e.g., for SSI, CAUTI, VAP).

Each question and answer is defined in the accompanying handbook, which supports interpretation and facilitates a reliable self-assessment process.[2]

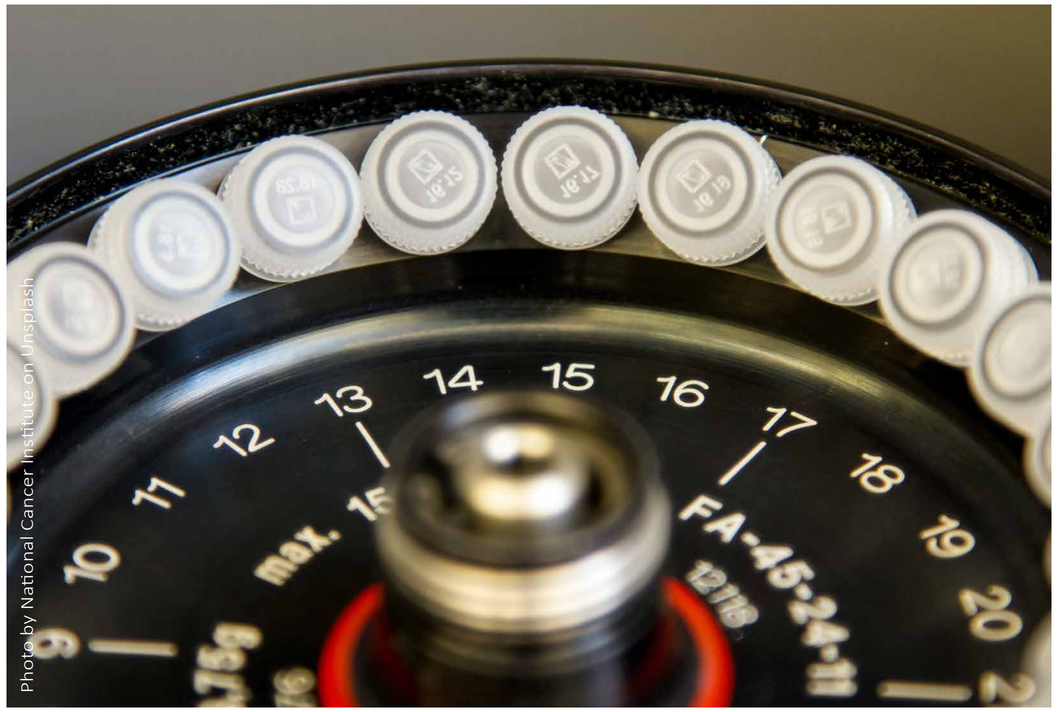


Photo by National Cancer Institute on Unsplash

1 Full Minimum Requirements Survey questionnaire https://www.swissnoso.ch/forschung-entwicklung/strukturelle-mindestanforderungen-hai/ueber-die-strukturellen-mindestanforderungen

2 Minimum Requirements Survey handbook: https://www.swissnoso.ch/forschung-entwicklung/strukturelle-mindestanforderungen-hai/ueber-die-strukturellen-mindestanforderungen

Within the framework of the CH-PPS, each participating hospital's results were assessed using weighted scoring to reflect the relative importance of answer patterns within each key component. Then points were normalised to a score of between 0 and 10 for each key component so that the weight of each of these 7 components was equal, resulting in a minimum overall score of 0 and a maximum score of 70.

Annex 2: CH-PPS methodology and data

The CH-PPS aims to collect representative data on healthcare-associated infections (HAI) and antimicrobial use (AU) in Swiss acute care hospitals, and, since 2022, to assess the implementation of evidence-based infection prevention and control (IPC) strategies. The protocol aligns with the European Centre for Disease Prevention and Control (ECDC) methodology (version 5.3) to allow international benchmarking.

In 2024, the PPS was expanded to include data on antiviral use and medication doses to enable calculation of defined daily doses (DDD). Hospitals could enter data either manually or via automatic upload using predefined technical specifications. The survey period ran from 1 April to 30 June 2024, with data entry permitted until July.

Training materials were made available online in German and French, and virtual «train-the-trainer» sessions were conducted to support hospital participation. Protocol changes were explicitly addressed in the training sessions.

Data were analysed using R version 4.4.1. Data were downloaded from the Charité database and stored anonymously on secure servers at University Hospital Zurich, accessible only within the hospital's protected network.

In 2024, 103 hospitals participated. For the first time, the national survey also included a self-assessment of the «Minimum Requirements» for IPC structure and processes, in line with the NOSO strategy.

Further information on PPS and methodology can be found on the Swissnoso website and in the original reports.[3]

Annex 3: The *StAR-3 Survey on Antimicrobial Stewardship* methodology

The StAR-3 Antimicrobial Stewardship survey was conducted as part of the national strategy to improve antimicrobial use in Swiss acute care hospitals. The questionnaire was developed based on a validated Dutch tool4 and adapted («helvetised») to the Swiss context. It covered key structural and procedural aspects of antimicrobial stewardship implementation such as leadership, guidelines, monitoring, education, audit and feedback, and IT support.

The questionnaire was sent to all 136 eligible Swiss acute care hospitals. Data collection took place between November 2024 and January 2025. Hospitals were asked to have the person responsible for antimicrobial stewardship complete the survey electronically.

A total of 70 responses were received, corresponding to a 5% response rate overall. The participation rate among central-level hospitals was 70%, allowing good national representativeness.

Data were anonymised and analysed using descriptive statistics. Subgroup comparisons were made by hospital type and language region, using R statistical software. The results provide a baseline for ongoing monitoring and further development of antimicrobial stewardship programmes within the StAR-3 framework.

For more information, refer to: www.swissnoso.ch/forschung-entwicklung/asp-monitoring

3 https://www.swissnoso.ch/punktpraevalenz-erhebung/ueber-die-punktpraevalenz-erhebung

4 Kallen, M. C., et al. «A survey on antimicrobial stewardship prerequisites, objectives and improvement strategies: systematic development and nationwide assessment in Dutch acute care hospitals.» Journal of Antimicrobial Chemotherapy73.12 (2018): 3496-3504. https://doi.org/10.1093/jac/dky367

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