From a guideline writing group to the Swiss National Center for Infection Prevention: 30 years of Swissnoso

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Establishment of Swissnoso and the "Bulletin": Guidelines for infection prevention & control

In 1991, Pierre-Alain Reber from the Federal Office of Public Health (FOPH) was asking for a group of experts to write national guidelines for infection prevention and control in acute care hospitals. Patrick Francioli, Lausanne, Didier Pittet, Geneva, and Andreas Widmer, Basel, were speaking at the Interscience Conference and Antimicrobial Agents (ICAAC) meeting in Chicago, and initiated this group: The branding name already took some time, as it should cover the different national languages and focus on nosocomial infections: The name "Swissnoso" was born. On September 1 1994, the first issue of the "Bulletin" was published as a supplement to the weekly bulletin of the FOPH (Figure 1, link to archive).

Christian Ruef, Zurich, and representatives of Ticino, Neuchâtel, and Berne, completed the core team. At this time, infection control was still considered as new and also unnecessary specialty. Even the specialty "infectious diseases" was not yet approved by the Swiss Institute of Medical Education SIWF/ISFM. In 1994, only four out of five of the Swiss university hospitals had an infection control unit: It took more than a decade until almost all hospitals had an infection control service[1].

Laurence Senn, Lausanne, took over as editor-in-chief of the bulletin after Giorgio Zanetti, and the name was changed to "Newsletter" with currently more than 1000 subscriptions. Laurence Senn initiated moving old bulletin articles to the archives and refreshed the look of this part of our homepage. Today, it is an excellent source for infection control staff to be updated with the latest developments with a critical appraisal of our experts.

Pioneering initiatives of infection control

In 1995, we published the first summary on the level of infection control in Switzerland[2]. Together with Andreas Voss, the Netherlands, international training courses were organized for infection prevention and control, as there were no standardized training courses available at this time in Switzerland. This training courses in collaboration with the Centers for Disease Control & Prevention (CDC), USA, and the European study group on nosocomial infections (ESGNI) were held over the years in Geneva (Pittet), Stein am Rhein (Ruef), and Brunnen (Widmer).

Transition from hospital hygiene to infection prevention and control

Before 1999, environmental cleaning, disinfection and sterilization was the primary goal of the "hospital hygiene", this was the old name for today's hospital infection control and epidemiology divisions, before the group moved the focus on prevention of nosocomial or healthcare associated infections (HAI). New technologies such as plasma sterilization, new European norms for sterilization, and alcoholic hand rub were reviewed. Hand hygiene with soap and water was standard of care in many institutions before the Swissnoso member Didier Pittet published scientific papers and finally the World Health Organization guidelines on hand hygiene in health care and Andreas Widmer the guideline on surgical hand hygiene[3] followed by the CDC guidelines4. In 2014, the module CCM Clean Hands, developed under the supervision of Matthias Schlegel, St. Gallen, was added to survey adherence of hand hygiene[5].

In 1999, a milestone on the political level was the first mandate of the FOPH to Swissnoso for a proposal for a new law on prevention of Creutzfeldt Jakob Disease (CJD): The Bovine Spongiforme Enzephalopathie (BSE) challenged reprocessing procedures as of today, as the variant CJD particles were found in primarily lymphoid and neurological tissues before patients became symptomatic: Steam sterilization was set at 134°C for 18 minutes, reducing the burden of prion on surgical instruments, and is still part of the current Swiss guideline "gute Aufbereitungspraxis". Fortunately, no cases were identified in Switzerland as of 2024.

Prevalence of healthcare-associated infection (HAIs)

In 1999, the first multicenter prevalence survey on nosocomial infections in Swiss hospitals was published[6]. Switzerland had one of the highest prevalences of HAIs in Europe with 11.6% compared to 4.4.% in Germany. The interest to participate in such studies raised dramatically from university hospitals to more than 60 participating hospitals in 2002. Not surprisingly, the prevalence of HAIs was almost twice as high in large tertiary care centers compared to smaller hospitals. Didier Pittet and Hugo Sax carefully analyzed our data, performed risk adjustments that allowed to explain the differences in the risk population in large tertiary care centers compared to smaller hospitals[7]. Media already blamed large hospitals for their high prevalence of HAIs: The stratified analyses clearly refuted such allegations. The preventable proportion was estimated to rationalize activities to decrease HAIs[8]. Yearly prevalence studies followed showing prevalences of 5.5%-6%. Swissnoso succeeded under the supervision of Walter Zingg, Zurich, to allow Switzerland to participate in the European prevalence study to better compare our results with other European countries[9]. In February 2024, the FOPH set a goal to lower the HAIs during a first step to 5% in 2030 followed by 4% in 2035, a milestone in the history of infection control and prevention.

Incidence studies and surveillance of HAIs

However, the inherent limitations of prevalence studies triggered the move to incidence studies and surveillance of HAIs. In 2001, Nicolas Troillet, Sion, initiated a surveillance on surgical site infections (SSI) in the Romandie and Ticino, and published their 13 years data[10]. In 2009, Swissnoso took over this SSI surveillance and by 2014, more than 200'000 surgeries were already included in the database. A fruitful collaboration with the Swiss National Association for Quality Development in Hospitals and Clinics (ANQ) was established in 2010 and continued as of today. In addition, a unique quality assurance system was installed: Each institution regularly underwent audits on-site. In some hospitals, up to 41 % of additional SSI cases were detected during the audit. As of today, the quality of surveillance is published as a score and results become publicly available at the ANQ homepage. Surveillance itself has an important impact on reducing the incidence of SSI[11]. However, Swissnoso opted for additional intervention activities to further reduce the incidence of SSI[12]. Analyses of the SSI database with high-quality data allowed to tailor intervention modules to the Swiss requirements. Timing of surgical antimicrobial prophylaxis (SAP) was set by the World Health Organization to a window of two hours prior to incision. The data from the Swissnoso database allowed to further improve the optimal time window for SAP: From 60-30 minutes to 30-0 minutes prior to incision, that facilitated adherence to the optimal window[13,14]. Rami Sommerstein, Lucerne, initiated an intervention tool, using a bundle of preventive activities, achieving a high adherence. Furthermore, current guidelines on ventilation of operating theaters were challenged by new models and validated by Swissnoso data[15].

In 2022, a new module - catheter-associated urinary tract infections (CAUTI) – was introduced into the surveillance modules after pretesting the module together with the "Stiftung Patientensicherheit Schweiz". Similar to SSI surveillance, a focused intervention followed under the supervision of Jonas Marshall, Bern, and continues to be operational[16].

Outbreak management

Outbreaks on a national, but also on an international level have been investigated and resolved: Examples were the outbreak in cardiac surgery by contaminated heater-cooler with *Mycobacterium chimaera*, a new pathogen never before associated with this device[11], and the source of infection identified[12]. An outbreak by vancomycin-resistant enterococci (VRE) involving several Swiss hospitals attracted media attention[13], and challenged current policies on admission screening of patients at risk of carriage of multidrug-resistant organisms (MDRO). It became clear that an organization was needed to rapidly respond to such outbreaks, as many involved pathogens do not belong to the mandatory reportable pathogens. In 2021, Swissnoso published updated guidelines for controlling the spread of such pathogens.

Management of outbreaks with multidrug-resistant organisms (MDRO)

In addition, under the leadership of Danielle Vuichard, Thurgau, Swissnoso developed a concept for the optimal detection and management of healthcare-associated outbreaks in 2022. However, a vancomycin-resistant enterococci (VRE) strain with reduced susceptibility to daptomycin seems to re-emerge. Timely detection and management remains a challenge, as they require close collaboration with clinical microbiology laboratories and special microbiology laboratories, such as the Nationales Referenzlaboratorium zur Früherkennung und Überwachung neuartiger Antibiotikaresistenzen (NARA) and the Swiss Centre for Antibiotic Resistance (ANRESIS).

Emerging antimicrobial resistance

Swissnoso's scope expanded beyond HAIs to combat emerging multidrug-resistant organisms (MDROs). Initiatives like the "StAR" strategy and antimicrobial stewardship programs focused on prudent antimicrobial use and surveillance of MDROs. The strategy "StAR» of the FOPH «Gesundheit2020» was introduced in 2015, and the rollout followed in 2016. Swissnoso started projects and components of antimicrobial stewardship to fight emerging MDROs, focusing on publishing guidelines of appropriate use of antibiotics for treatment of common infectious diseases as well as surveillance of *Clostridoides* difficile as a surrogate marker of antimicrobial use[17]. Today, Switzerland has a very low prevalence of MDROs and most isolated pathogen derive from visitors of foreign countries. However, Geneva had higher rates of methicillin-resistant *Staphylococcus aureus* (MRSA) in the past than most other cantons. Over a decade, the team of Stephan Harbarth succeeded to significantly reduce the prevalence of MRSA from 10% to less than 4%, lower than in many other regions of Switzerland[18].

Minimum requirements for hospital for infection prevention and control

In 2022, structural minimum standards were developed by a working group led by Swissnoso with the involvement of the relevant professional societies: A next, very crucial milestone in the history of Swissnoso was accepted by the FOPH, the Gesundheitsdirektorenkonferenz (GDK), and H+ when they acknowledged the significance of these national minimum requirements and recommend their implementation by the cantons and hospitals. The background was derived from World Health Organization, the Centers for Disease Control and Prevention, and European societies.

Generating new insights from analyses of two databases

The Swiss Implant Registry SIRIS collects data from patients after orthopedic surgery with a focus on surgical outcomes while Swissnoso focuses on SSIs. I have successfully submitted a quality improvement project to the Federal Quality Commission which allowed Swissnoso to extract more detailed data to permit more precise recommendation for prevention of SSIs after orthopedic surgery, but also consequences of an implant-associated infection. The collaboration may become a landmark start-up for saving resources for data entry, while improving quality and getting new insights for recommendations for infection prevention and control.

Ongoing surveillance projects under development:

Central-line associated bloodstream infections (CLABSI) are not as frequent as SSIs, but lead to a very high mortality. Under the supervision of Stephan Harbarth and Niccolò Buetti, Geneva, a national digital surveillance system is in the advanced pilot phase.

Surveillance of ventilator-associated pneumonia (VAP) was initiated by Rami Sommerstein, Lucerne, and has well advanced with the strong support of the leaders of the intensive care units.

Non-ventilator hospital-acquired pneumonia (nvHAP) surveillance is also in the current projects, led by Aline Wolfensberger, Zurich: Many baseline studies have already been completed[19].

Digitalization: Many data are still entered manually: the project digitalization lead by Hugo Sax aims to decrease workload, improve quality of digitally acquired data, and perform ongoing analyses with the ultimate goal of an online dashboard.

Organization and Management

Swissnoso started as an association with guidelines and activities that were managed by the presidential secretarial support with Patrick Francioli, Lausanne, Hugo Sax, Geneva, Christian Ruef, Zurich, followed by Andreas Widmer, Basel, in 2012. However, the number of members of Swissnoso increased as well as the projects as mentioned above, requiring a professional support in terms of organization and finances. Erich Tschirky was elected as secretary general in 2012, after several years of involvement in different projects. He was and is crucial for the

organization of Swissnoso: Today, Swissnoso is leading a group of 18 members with their academic teams in different hospitals supported by 13 employees from the general secretariat. All contributors to this network are working on a part time basis for Swissnoso.

In conclusion, Swissnoso's journey over the past three decades reflects its unwavering commitment to excellence in infection prevention and control. Through collaboration, innovation, and proactive intervention, Swissnoso has transformed the landscape of infection prevention and control in Switzerland and beyond, ensuring safer healthcare environments for all.

The commitment of many stakeholders towards Swissnoso, in particular with representatives of the FOPH (e.g., Céline Gardiol, Daniel Koch, Hans Matter) enabled Swissnoso to provide guidelines and best practices for the prevention of HAIs. The partnership with ANQ represented by Regula Heller and Petra Busch goes well beyond of surveillance of SSIs. I am thankful to our partners to have been part of this pioneer phase, and looking forward to continue our vision on the way to zero risk of HAIs.

Personal statement and future of Swissnoso

It was a privilege to serve for 30 years as founder and president. Thanks to all members, the outstanding secretarial support, and the too many to mention who allowed the move from a small bulletin writing group to the Swiss National Center for Infection Prevention. The future of Swissnoso should keep the pioneer spirit as it moves to a professional association. It will take even more efforts to keep this innovational character to prevent HAIs from bottom up as finances are continuously getting scarce.

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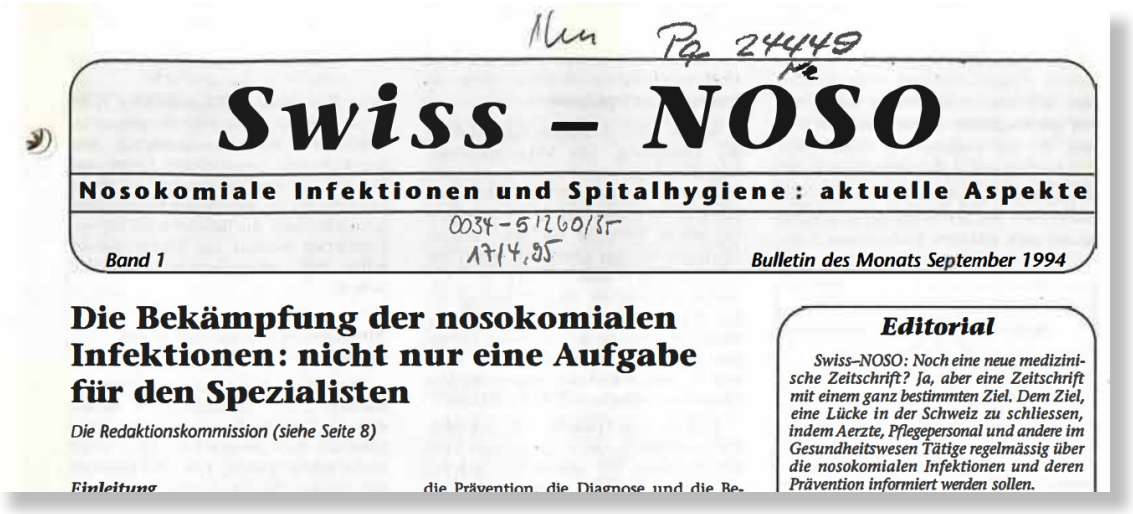
Figure: Homepage and first edition of the “Bulletin” 1994



Swiss – NOSO

Nosokomiale Infektionen und Spitalhygiene: aktuelle Aspekte

Band 1 — Bulletin des Monats September 1994

Die Bekämpfung der nosokomialen Infektionen: nicht nur eine Aufgabe für den Spezialisten

Die Redaktionskommission (siehe Seite 8)

Editorial

Swiss–NOSO: Noch eine neue medizinische Zeitschrift? Ja, aber eine Zeitschrift mit einem ganz bestimmten Ziel. Dem Ziel, eine Lücke in der Schweiz zu schliessen, indem Aerzte, Pflegepersonal und andere im Gesundheitswesen Tätige regelmässig über die nosokomialen Infektionen und deren Prävention informiert werden sollen.

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