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# Hand disinfection in the hospital - implications for compliance and risk management

## Extended Abstract

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## **Abstract**

The risk of nosocomial infections is a major challenge for every hospital. Especially hand disinfection has a noticeable impact on the infection rate. Compliance measures should help to maintain hygiene standards and thus minimize the risk. Nevertheless, infringements by those responsible often occur. The current article highlights empirical findings from a study of 151 hospitals in Germany, Austria, and Switzerland focused on the non-compliance conducted by the Aalen Institute for Corporate Management (AAUF) in 2019.

## 1 Introduction

Research shows that more than every fourth hospital does not fulfill the hygiene standards. Every year, up to 600,000 people in Germany become infected with dangerous germs and about 10,000 to 15,000 patients die from the consequences of hospital germs (Bundesministerium für Gesundheit, 2019).

The main purpose of hand disinfection is to prevent the spread of pathogens, which have reached the hands of medical staff. This is intended to protect both the patient and themselves. The Robert Koch Institute shows that it is assumed that up to 90% of nosocomial infections are transmitted via the hands and even one third of all nosocomial infections are considered as preventable. For this reason, hygienic hand disinfection is one of the most important measures in the prevention of nosocomial infections (Robert Koch-Institut, 2006, S.2).

In addition to standard measures like wearing protective clothing, disinfecting of hands or equipment, materials, and objects, there are further measures recommended by experts. In some cases, neglect or poor implementation by hospitals thus leads to non-compliance with regulations. This is caused by insufficient care, stress, a lack of knowledge, the damages disinfectant causes the skin, or just because it is not perfectly represented by others.

For this reason, the article is based on the missing or non-compliant standards, which the survey aims to analyze in order to reveal the lack of hygiene in hospitals. Non-compliance will be further investigated, focusing on the following five theses.

## 2 Derivation of hypothesis

The most important factor in the prevention of nosocomial infections is regular hand disinfection (Robert Koch-Institut, 2016, S. 1191). A lack of hand hygiene compliance, therefore, has a significant impact on the infection rate of a hospital.

However, the regulations are often insufficiently complied with. The cause is usually not a lack of training, but rather a lack of capacity to carry out observations and avoid non-compliance. At the same time, hygiene officers are often not taken seriously enough, which makes a balanced discussion with those concerned impossible. Furthermore, incompatibilities or skin damage caused by disinfectant are also possible factors of non-compliance.

Accordingly, five theses were formulated to determine the assessment of hospital employees and managers:

H1: Hand hygiene compliance has a decisive influence on the infection rate in the respective hospital.

H2: Despite sufficient training, hand hygiene compliance is not sufficiently observed – a change in behavior is difficult to initiate.

H3: There is too little capacities in hygiene department to carry out observations and increase compliance.

H4: Hygiene professionals are sometimes not taken seriously and often cannot speak at eye level with those affected by non-compliance.

H5: Hand disinfection damages the skin. Therefore, frequent hand disinfection is avoided.

### 3 Methodology and Sampling

The theses were tested by using means of an online questionnaire that was active from November to December 2019. Hospitals located in Germany, Austria or Switzerland were randomly selected. In response, 1,077 hospitals were contacted by e-mail. A total of 142 respondents answered the theses, which corresponds to a participation rate of 13 percent. Due to the adjustment of the population for missing information, the following charts may nevertheless show deviations from the original 142 answers.

Of the hospitals surveyed, 52 percent are general clinics, 20 percent are specialist clinics and a further 20 percent are university clinics. The remaining 8 percent consist of in-patient hospitals and practice clinics. The clinics are 71 percent publicly owned. The test persons themselves are increasingly (56 percent) involved in hospital hygiene. A further 20 percent works in nursing and nursing management, a total of 15 percent as medical staff and managing medical staff, 8 percent of the test persons work in hospital management and 1 percent in facility management. More than half (54 percent) of the hospitals have between 500 and 1.000 beds available, 20 percent have more than 1.000 and 26 percent have less than 50 beds available. The surveyed hospitals are in almost identical proportions based in Germany, Austria and Switzerland.

### 4 Descriptive Statistics: the Results

As a basis for the contrasts, the test persons' assessments of the theses on disinfection in hospitals were used. The answers correlate significantly with the functional area and the number of beds. The graphs illustrate the mean value of the theses as a function of the respective parameter.

Figure 1 shows the contrasts between the functional areas and the average assessment of the theses. The functional areas agree almost equally with hypothesis H1, H2 and H4. Above all, differences are found above all in the lack of capacities to perform observations (H3). While the (managing) medical staff mostly agrees, the nursing (management) staff more often rejects the hypothesis. The discrepancies between hospital hygiene and hospital management are particularly drastic in the assessment of hypothesis H5: Hospital management and medical staff perceive the harmfulness of disinfectants (H5) to be significantly higher than nursing and, above all, hospital hygiene.

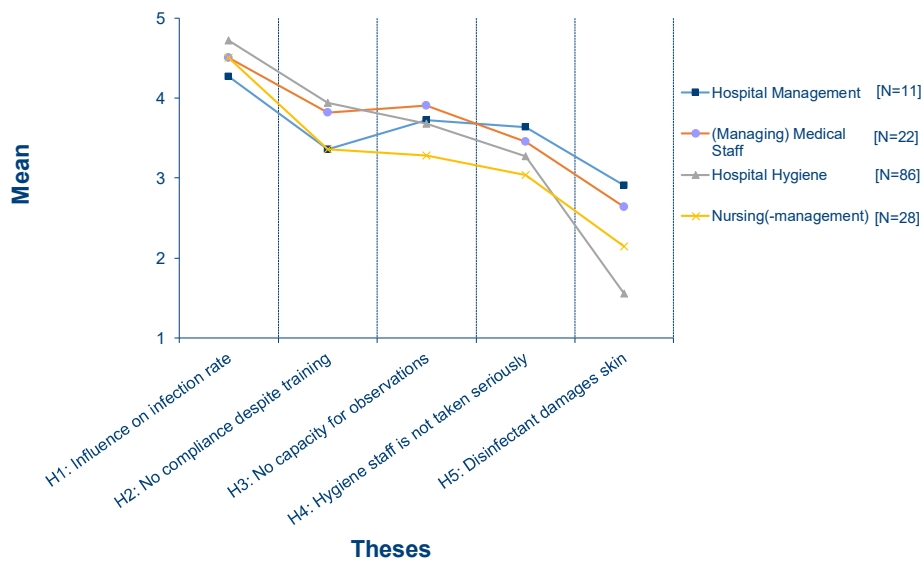


Figure 1: Contrasts of theses and functional area

Even when considering the number of beds (see Figure 2), opinions on the harmfulness of disinfectants differ: Hospitals with less than 50 beds as well as those with more than 1000 beds contradict the hypothesis most clearly. In general, hospitals with less than 50 beds contradict the theses more frequently than hospitals with between 50 to 99 beds. In addition, the mean values of H4 are also interesting: large hospitals with over 1000 beds are more likely to think that hygiene staff are not taken seriously than small hospitals with less than 50 beds.

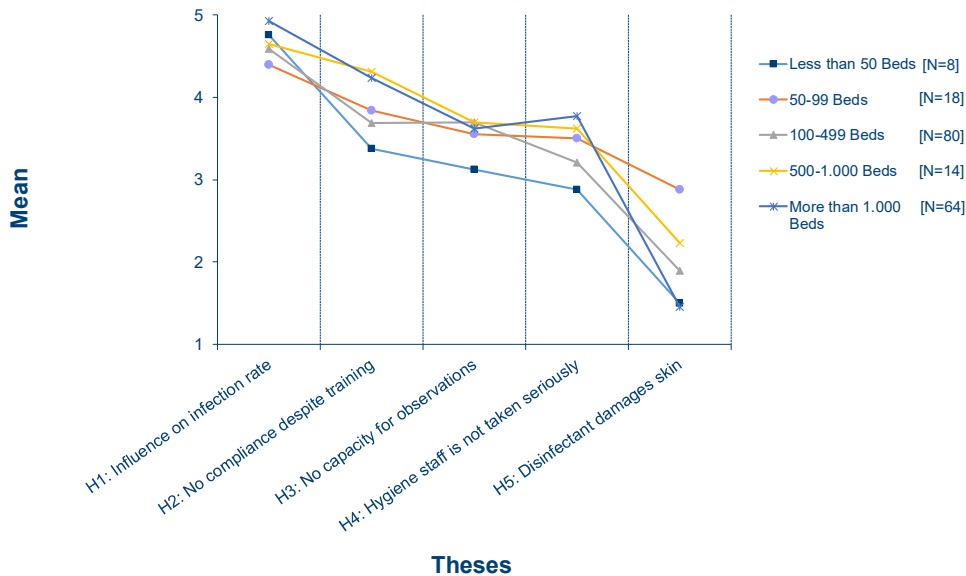


Figure 2: Contrasts of theses and number of beds

## 5 Discussion and Conclusion

The results of the survey clearly show the high impact of hand hygiene on infection rates, regardless of the functional area or number of beds. Thereby, hand disinfection plays an important role.

At the same time, the hypothesis is confirmed that compliance violations occur despite sufficient training. This is due in part to hygiene staff is often not taken seriously. Constructive feedback or supporting measures, for example, which are introduced to increase compliance, are accordingly ineffective. On the other hand, hospitals lack the capacity to prevent violations. Employees often complain about stress and understaffing, which is why regular hand disinfection is not carried out properly. But this also means that mutual observation and control of compliance are not guaranteed.

The result of the last hypothesis is surprising: The majority of the test persons deny that disinfectants damage the skin. There are no significant differences between the size of the hospital or the functional area of the test person. Harmfulness is therefore not the reason to neglect hand disinfection. Despite the high influence of hand hygiene on infection rates and numerous training courses for employees, the risk of non-compliance still exists. Possibilities for compliance certainly exist in digitization, which simplifies data collection and evaluation with the help of apps or specialized programs and opens up more targeted fields of action.

There are three main implications for the practice of compliance and Risikomanagement in hospitals:

- 1) The knowledge of the rules for hand disinfection must be increased among the staff - not only since Corona. In addition, acceptance must be increased through training and further education.
- 2) Compliance with the rules must be monitored. Digital technologies such as monitoring of soap and disinfectant dispensers and camera solutions are suitable for this purpose.

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3) Hand disinfection must be embedded in a hospital-wide compliance and risk management system. The interlocking of hygiene management and compliance has not been sufficient in hospital practice so far.

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