

## Economic Evaluation of Hand Hygiene

The [European Centre for Disease Prevention and Control \(ECDC\)](#) published a literature review on “[Economic evaluations of interventions to prevent healthcare-associated infections](#)” in April 2017.

As we presented in [our previous post](#), healthcare-associated infections (HAI) are major public health-related threat in Europe; 3.2 million patients are infected annually in European acute care hospitals. Hospitals conduct different interventions to fight against HAI, but it is not always clear how effective are these. Interventions can be hand hygiene, screening, isolation and decolonisation, personal protective equipment, cleaning and decontamination, antibiotic stewardship or a combination thereof.

ECDC reviewed the literature to find data on the cost-effectiveness of these interventions. They found 1973 studies (note that the search was performed in 2012). Only 28 papers met the inclusion criteria, and the qualities of these studies were very heterogeneous.

From the 28 included studies, only 4 focused on hand-hygiene, and all that four studies were considered of poor quality.

- The study of [Nthumba et al.](#) was conducted in a rural hospital in Kenya, which was poor in water resources. Although they used the most robust study design, it is unlikely that findings could be generalized to the European healthcare setting.
- [Weight et al.](#) compared two hand aseptics; a traditional one with 6 minutes application time, and a newer one, with only 2 minutes application time. The primary outcome was incidence of wound infection. There was no statistically significant difference between the two groups.
- [Chen et al.](#) used a before-and-after study for the evaluation of a hand hygiene program. Outcome was measured as of infection rate, and it was projected to “cost per infection prevented”. They found that the cost of preventing one HAI was 163.60 USD. Every dollar spent on the program resulted 23.70 USD benefit to the hospital. They used sophisticated regression methods, but they have not reported sufficient details on costs, e.g., no staff costs were considered.
- [Harris et al.](#) applied a wide infection control program, which included not only strict hand hygiene protocol, but also implementing ventilator-associated pneumonia preventive bundle and guidelines for central-line catheters. Primary outcomes were the probability of HAI and in-hospital mortality. They found that in the post-intervention period—both clinical and economic—outcomes significantly improved. Adjusted hospital direct cost-savings were estimated at 12,136 USD per patient. The study did not present the volume of resource use and/or the associated unit costs.

The heterogeneity of settings and the poor quality of the studies did not allow any quantitative analysis, and prevented to draw any general conclusion.

The 28 studies were generally of either poor or adequate quality. Based on these results, it would be difficult to draw any conclusion on the cost-effectiveness of any of the interventions, and would be hard to tell which intervention would be cost-effective in an alternative hospital setting.

The aim of this project was not only to review the cost-effectiveness literature, but also to support experts in creating a framework for future cost-effectiveness analyses. As the included studies were heterogeneous in quality, type of intervention, population, settings, model structure, prevalence and incidence rates, it was not possible to give any general recommendations. Future evaluations should be supported by high-quality evidence. **“Drawing conclusions on the basis of heterogeneous, weak evidence could lead to inappropriate decision making.”**

ECDC came to a conclusion that further research would be necessary on this field, and new studies should be designed according to these principles:

Studies need to be comparable, and should precisely specify the following criteria:

- baseline prevalence rates
- screening test selection
- sensitivity and specificity of the selected test
- effectiveness of decolonization
- adherence levels
- mupirocin resistance and efficacy
- turnaround time of test
- transmission
- compliance
- time horizon
- outcome considered

Before evaluating the cost-effectiveness of an intervention, the clinical effectiveness needs to be proved. Ineffective interventions should be excluded from further analysis.

As we mentioned before, the literature search was conducted in 2012. Thence, new studies were published on this topic, e.g., [Seko et al. 2017](#), and [Rattanaumpawan et al. 2017](#). Although, new studies were not categorized and graded according to the strict ECDC criteria, yet.

### Conclusion:

There are only a limited number of studies investigating the cost-effectiveness of infection prevention interventions, and the quality of these studies varied. Further research on this field is clearly needed. Studies should be methodologically more precise. Only interventions that are clinically effective (factually preventing HAI) should be evaluated for cost-effectiveness.

Read our previous post on [Healthcare-Associated Infection Surveillance in Europe](#) and [How Effective is Hand Hygiene](#).

### Reference

ECDC: Economic evaluations of interventions to prevent healthcare-associated infections. Stockholm: ECDC; 2017.