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Verification of the Impact Calculation of Appropriate Hand Hygiene Practices

Client: SAG Flowmedik

Verification Report Conducted by: Sitowise

Introduction

SAG Flowmedik has developed a calculation model to demonstrate the economic impact of appropriate hand hygiene practices. The calculation considers the current incidence of hospital-acquired infections, the cost of a single infection, the baseline level of appropriate hand hygiene, and the change in the level of appropriate hand hygiene.

A Sitowise emissions calculation expert has verified the assumptions, sources, and calculation logic based on the materials provided by the Client.

Evaluation of Sources Used in the Calculation

The sources used in the calculation were reviewed during the verification process. Observations regarding the sources have been compiled in the table below.

Source	Verification Comment
1 "Appropriate hand hygiene prevents up to 50 % of avoidable infections acquired during health care delivery" Source: WHO - Key facts and figures World Hand Hygiene Day 2021	The World Health Organization (WHO) is considered a reliable source. The source is up-to-date (2021), and the information extracted from it is accurately represented in the document.
2 "According to data provided by the Hospital in Europe Link for Infection Control through Surveillance (HELICS) (http://helics.univ-lyon1.fr/helics/home.htm), approximately 5 million HCAs are estimated to occur in acute care hospitals in Europe annually, representing around 25 million extra days of hospital stay and a corresponding economic burden of €13–24 billion." Source: WHO - Guidelines on Hand Hygiene in Health Care (s. 6)	The World Health Organization (WHO) is considered a reliable source. Although access to the original source (in parentheses) was no longer available, WHO's information is trustworthy, based on research and international collaboration, making it credible. However, the source is from 2009, meaning the data is somewhat



20.8.2024

	outdated but still deemed applicable for the calculation. It is recommended to use a more recent source for the cost of a single hospital-acquired infection if available.
3 "In Finland, approximately 100,000 healthcare-associated infections occur annually, half of which are in hospitals and half in long-term care." Source: THL - Hoitoon liittyvien infektioiden seuranta	The Finnish Institute for Health and Welfare (THL) is considered a reliable source. Additionally, the source is current (2023), and the information extracted is accurately represented in the document.
4 "A total of 8.9 million healthcare-associated infections were estimated to occur each year in European hospitals and long-term care facilities. 4,5 million HAIs occur in hospitals. More than half of certain HAIs are considered preventable." Source: ECDC - Healthcare-associated infections - a threat to patient safety in Europe	The European Centre for Disease Prevention and Control (ECDC) is regarded as a reliable source. Although the data is from 2018, the source is considered applicable for the calculation. The information extracted is accurately represented in the document.

In summary, the sources underlying the calculation are based on scientific evidence and consist of up-to-date information from reliable healthcare authorities.

Calculation Scope and Considerations

The calculation demonstrates the impact of hand hygiene on the incidence of infections and, consequently, on economic outcomes. The economic valuation of hand hygiene considers the number of infections, the cost of individual infections, and the effect of changes in hand hygiene practices on the reduction of infections.

The fundamental assumption in the calculation is that approximately 50% of hospital-acquired infections can be prevented with appropriate hand hygiene practices. The calculation formula is presented below:

$$X = \frac{Y}{1 - \frac{A}{2}} * Z * \frac{B}{2}$$



20.8.2024

X = Monetary value of appropriate hand hygiene

Y = Amount of hospital acquired infections

Z = Cost of a single hospital acquired infection (2600–4800 € EU)

A = Starting level of performed appropriate hand hygiene (% , as a decimal in the formula)

B = Altered level of performed appropriate hand hygiene (% , as a decimal in the formula)

The sources used as the basis for the calculation are deemed reliable. However, the source for the cost of a single hospital-acquired infection dates to 2009. If a more recent source is available, it is recommended to update this cost accordingly.

The formula assumes a linear relationship between the improvement of hand hygiene and the reduction of infections. It should be noted that, in reality, the situation is not as straightforward as the method presented in the formula, as hospital-acquired infections are often influenced by more complex factors. Nevertheless, this simplified approach serves the purpose and practicality of the calculation and facilitates its communication.

Summary of Verification Report Observations

Based on the verification conducted, it can be concluded that the formula is logical and accounts for both the number of infections and the costs associated with changes in hand hygiene levels. Although the formula assumes a linear relationship between improved hand hygiene and reduced infections, this simplification is sufficient for assessing the economic impacts. The formula provides an effective and clear method for illustrating the connection between hospital-acquired infections and hand hygiene. The sources used in the formula can be updated depending on the specific use case or when more current information from a trustworthy source becomes available. **As a development suggestion, it is recommended to update the background data for the cost of a single hospital-acquired infection with a more current source if available.**

