



PATENTS AND
TECHNOLOGIES

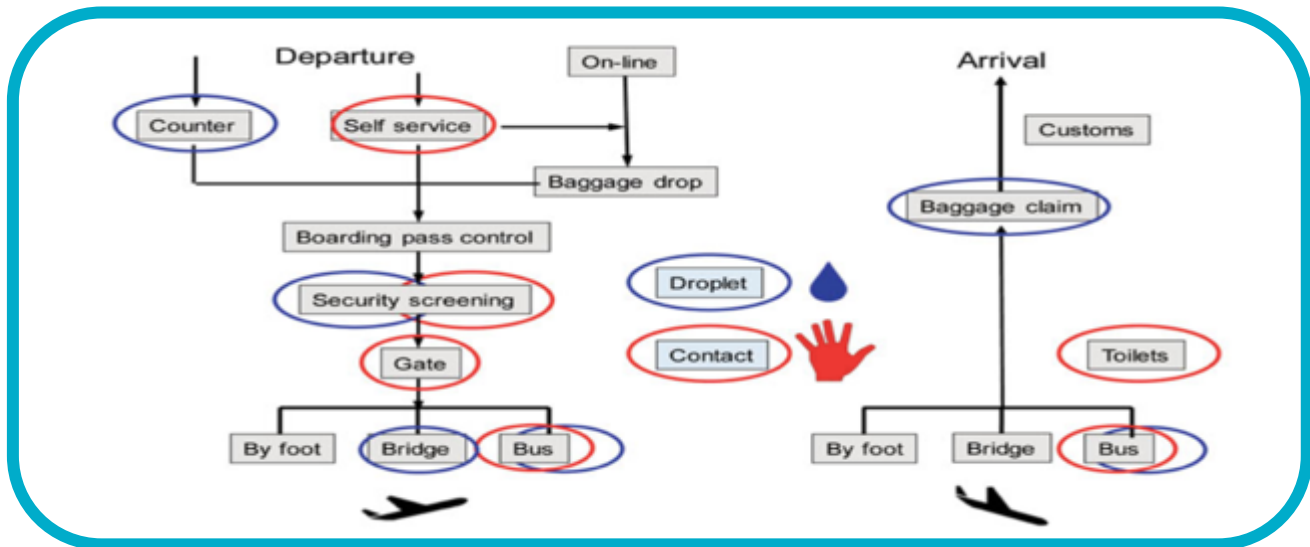
BIOVITAE[®]
WWW.BIOVITAE.IT



Description and results of tests carried out by VTT – Technical Research Centre of Finland – before and after installing **BIOVITAE**[®] Microbicidal LED lights in the first aid station at the Fiumicino Airport in Rome.

BIOVITAE[®] is the only patented sanitising LED light technology able to respond to antibiotic resistance: it kills all bacteria and prevents allergies caused by excess bacteria and mould.

The range of **BIOVITAE**[®] frequencies acts on the microbial metabolism (GRAM+ e GRAM-, spores, moulds and fungi) and kills it. **BIOVITAE**[®] is a LED light (UV-free) so, unlike UV light, it is not harmful to human beings and animals. The microbicidal action of **BIOVITAE**[®] sanitizes environments without sterilizing them, thereby preventing outbreaks of infectious diseases without compromising the immune system.

VTT - Technical Research Centre of Finland – PANDHUB STUDY



 	Risk of droplet-transmitted infections (coughing, sneezing, breathing)
	Risk of infection due to direct contact

The PANDHUB study showed that **hubs, airports in particular, are the most dangerous environments along with hospitals for the spread of viruses and bacteria.**

Millions of people pass through airports (Fiumicino alone sees about 50 million people per year) of different nationalities (therefore a large variety of bacteria) with a wide range of health issues.

The normal cleaning cycles guarantee adequate hygiene in general, but they **don't always guarantee adequate bacterial hygiene** to protect against the risk of infection.

Some objects are never part of the cleaning cycles and are touched everyday by millions of hands; for example security check trays, baggage conveyor belts, POSs, and handrails.

In these cases, detergents are not effective, but light is because it gets everywhere.

ADR (Aeroporti di Roma Spa) AND BIOVITAE: FIELD STUDY TO EVALUATE THE MICROBICIDAL EFFICACY OF BIOVITAE

Testing was entrusted to VTT in virtue of the expertise acquired in three years of PANDHUB research.

Aim of the Study

To evaluate the microbicidal efficacy of BIOVITAE® lighting devices in real environment. **The *in vivo* study was performed at the first aid hospital of Rome's Fiumicino airport.**

Objective

The evaluation of the trend of the total bacterial count through samples taken from different surfaces both before and after the installation of the BIOVITAE® lighting systems to measure the level of bacterial hygiene (with no connection to general hygiene or visible dirt), responsible for infection.

Sampling was planned to be performed for each surface twice before installing BIOVITAE® lighting systems and four times after the installation.

Twenty surface spots were selected for sampling.

Sampling Sites

The emergency rooms of the Rome Fiumicino airport handles all health emergencies for airport staff and the companies operating within the airport, as well as over 50 million customers that pass through every year.

A total of about 11,000 first aid services per year.

Sample identification	SAMPLING SITE		
	Room	Site	Height (meters) *
A1	L1	Main entrance	Shelf
A2			Shelf
B1	L1	Registering station	Desk
B2			Desk
C1	L3	First-aid station	Doctor's desk (external side)
C2			Doctor's desk (external side)
C3			Doctor's desk (internal side)
C4			Doctor's desk (internal side)
C5			Examination bed
C6			Examination bed
D1	L9	Patient's recovery room	Patient's bed Table
D2			Patient's bed Table
D3			Patient's handle
D4			Patient's bed rails
D5			Patient's bed rails
E1	L4	Reporting room	PC Keyboard
E2			PC Monitor
E3			Sphygmomanometer
F1	L22	Doctor's Room	Doctor's desk
F2			Doctor's desk

* Height: the distance of the sampling site from the ceiling, measured by the means of a laser meter.

VTT STUDY: benchmarks

The **BENCHMARKS** to measure the levels of bacterial hygiene refer to previous hospital studies carried out by VTT and are defined in the following bacteria threshold limit:

12 CFU/100 cm² = **good bacterial hygiene**

12-40 CFU/100 cm² = **inadequate bacterial hygiene**

> 40 CFU/100 cm² = **poor bacterial hygiene**

RESULTS OF THE VTT STUDY: BIOVITAE IN ADR

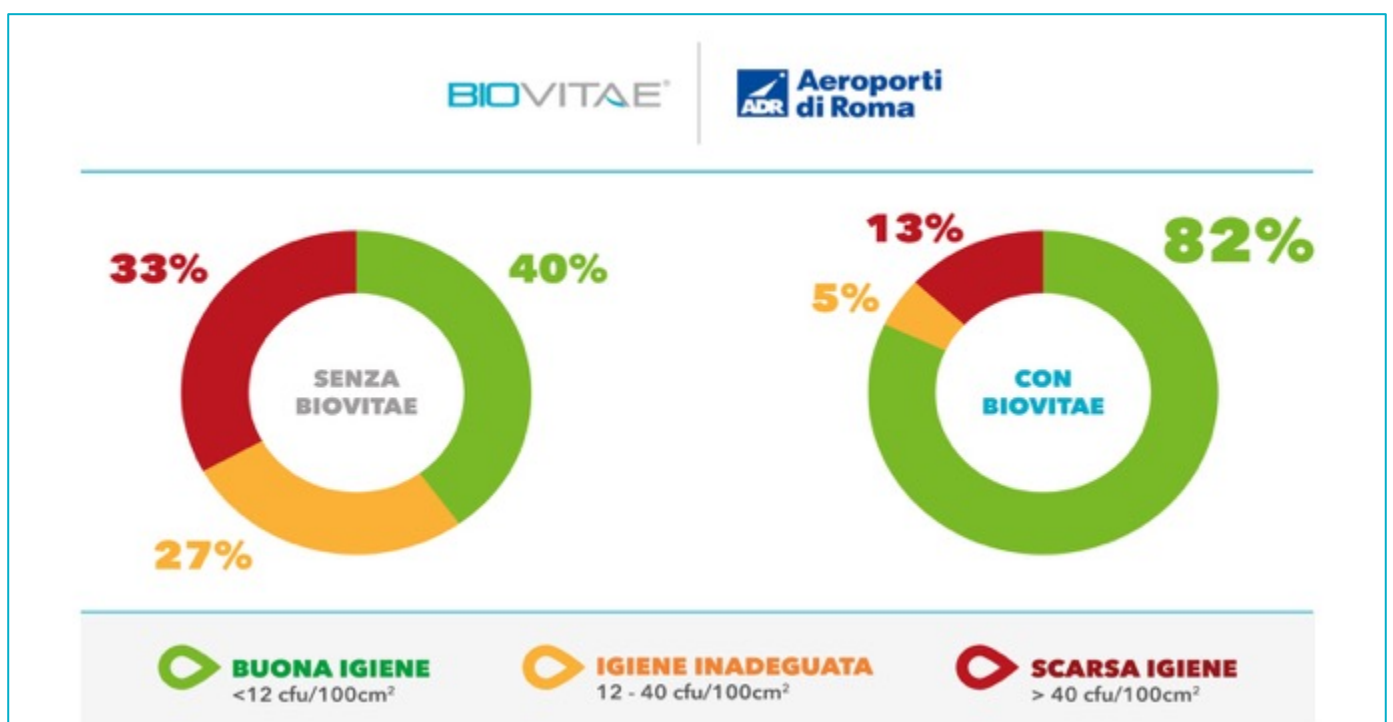
The results of the VTT study showed that, after the installation of BIOVITAE® lighting devices, **the overall levels of bacterial hygiene improved significantly in all the sampling places.**

The use of BIOVITAE® in sampling places:

increased good hygiene from **40% to 82%**

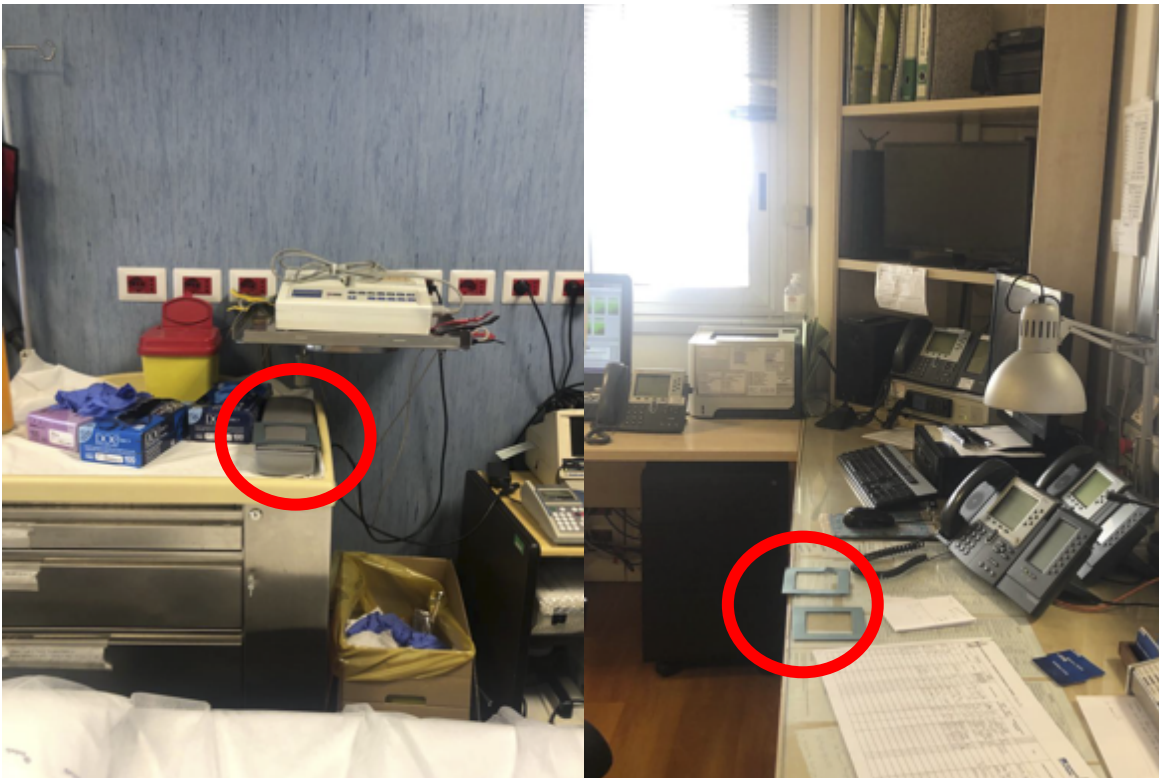
reduced inadequate hygiene from **27% to 5%**

reduced poor hygiene from **33% to 13%**



NOTE FOR EVALUATION OF THE RESULTS

Poor and inadequate bacterial hygiene were found in two specific sampling spots; on a sphygmomanometer and on the desk at the registering station. In the former, the sphygmomanometer was placed under a metal shelf that prevented the light from reaching the area subject to sampling. In the latter, the light was non-operational for most of the staff's working hours because the area is irradiated by adequate natural light.

**MARKETING & COMMUNICATION**

Chiara Cavallo
+39.338.3566988
chiara.cavallo@p-ptech.it

PRESS OFFICE
press@p-ptech.it