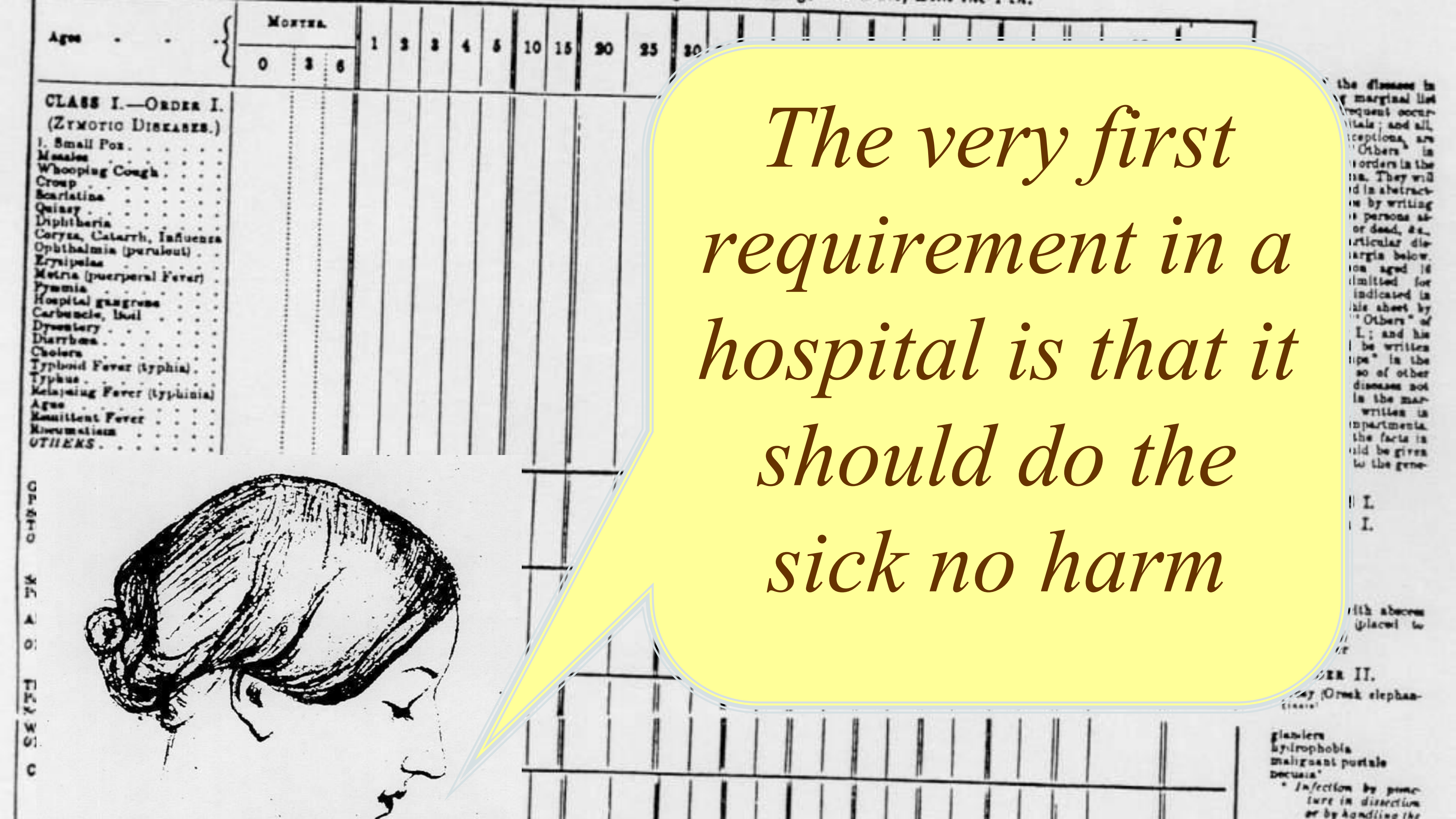
University College of Southeast Norway

Smittevern-utdanningen

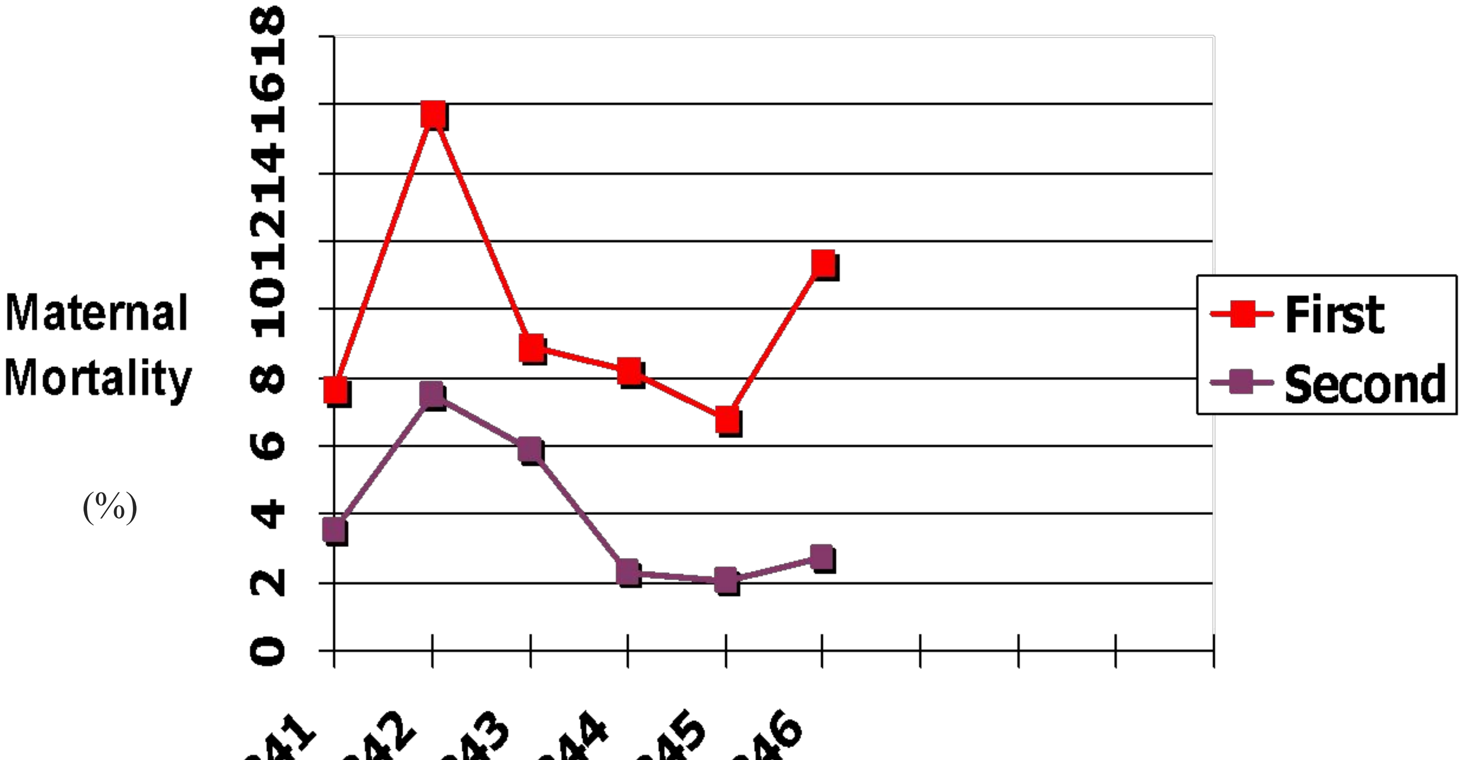
Jörn Klein; PhD, MPhil, Dipl.-Ing.
Associate Professor in Microbiology

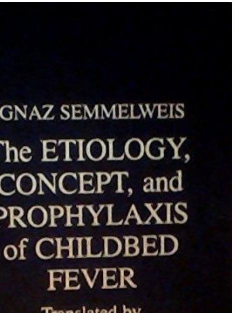
Faculty of Health Sciences
Department of Nursing & Health Science


The very first requirement in a hospital is that it should do the sick no harm
Ages
Months
CLASS I.—ORDER I.
(ZYMOTIC DISEASES.)
1. Small Pox
Measles
Whooping Cough
Croup
Scarlatina
Quinsy
Diphtheria
Coryza, Catarrh, Influenza
Ophthalmia (purulent)
Erysipelas
Metria (puerperal Fever)
Pyæmia
Hospital gangrene
Carbuncle, Boil
Dysentery
Diarrhœa
Cholera
Typhoid Fever (typhia)
Typhus
Relapsing Fever (typhinia)
Ague
Remittent Fever
Rheumatism
OTHERS

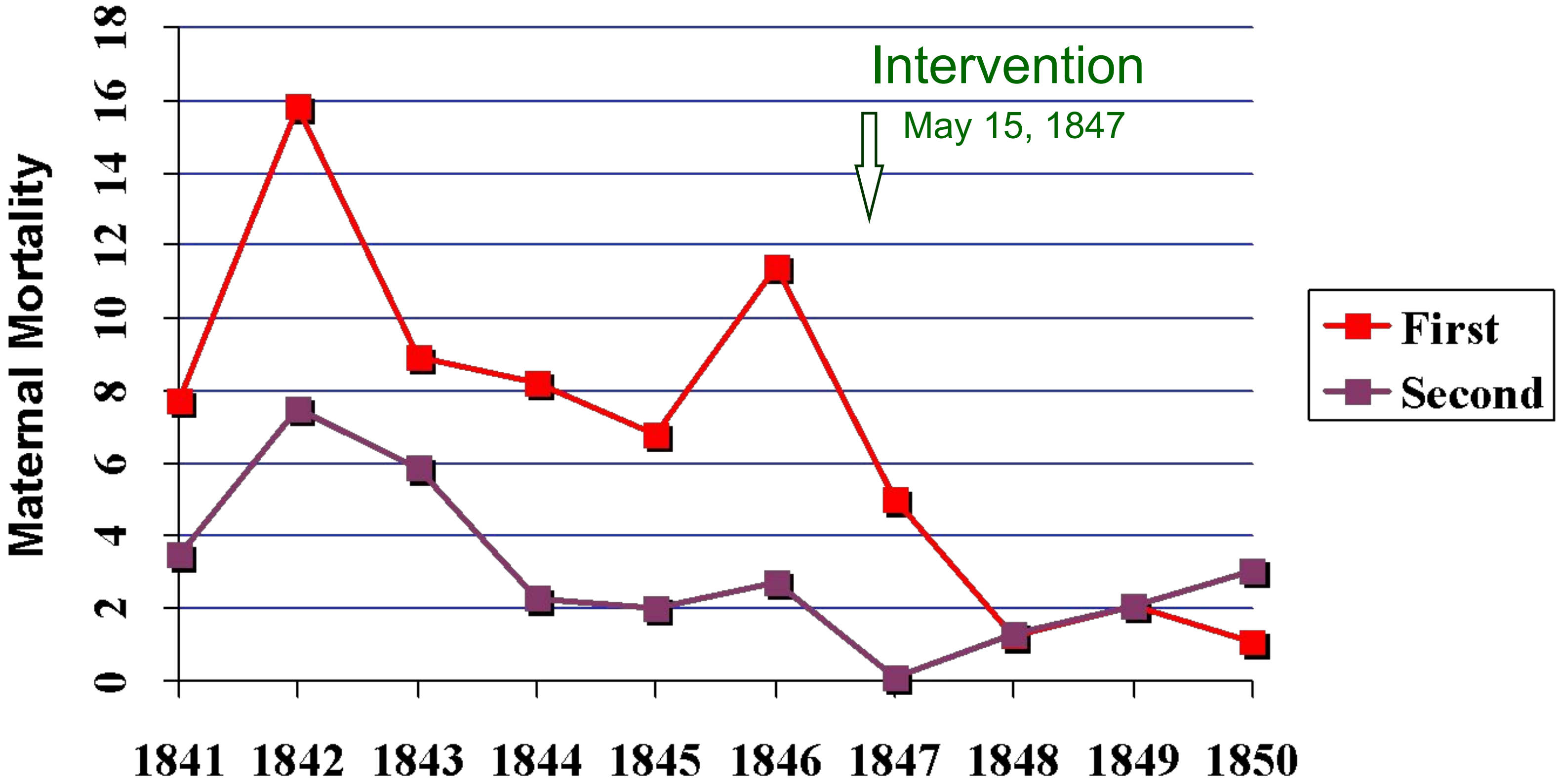
Ignaz Philipp Semmelweis

First and Second Obstetric Clinics, GENERAL HOSPITAL OF VIENNA, 1841-1850





Maternal mortality rates,
First and Second Obstetric Clinics,
GENERAL HOSPITAL OF VIENNA, 1841-1850



Joseph Lister revolutionized surgery because of his belief in Pasteur’s use of carbolic acid as an antiseptic spray. He insisted that all instruments and physicians’ hands be washed with the solution.

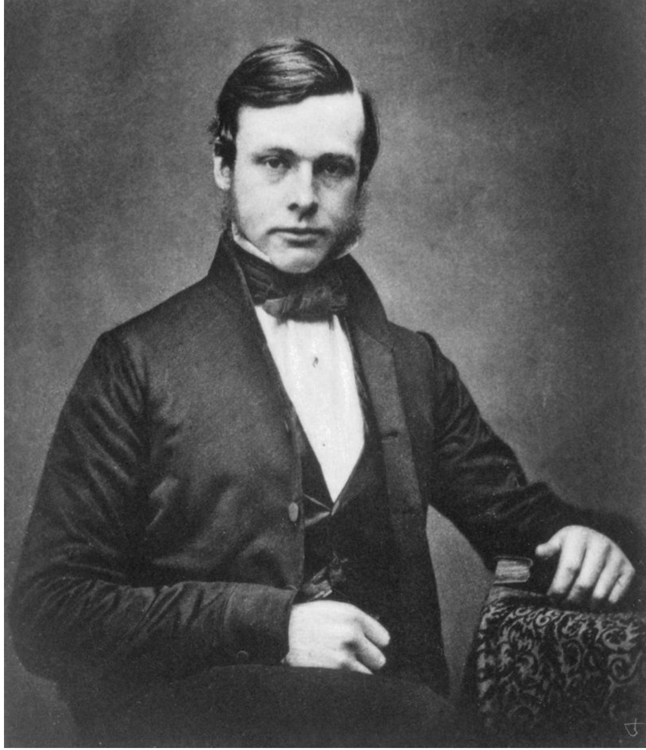
ON THE ANTISEPTIC PRINCIPLE IN TH
PRACTICE OF SURGERY.*

BY JOSEPH LISTER, ESQ., F.R.S.,
PROFESSOR OF SURGERY IN THE UNIVERSITY OF GLASGOW.

IN the course of an extended investigation into the natu of inflammation, and the healthy and morbid conditions of tl blood in relation to it, I arrived, several years ago, at the co clusion that the essential cause of suppuration in wounds decomposition, brought about by the influence of the atm sphere upon blood or serum retained within them, and, in tl case of contused wounds, upon portions of tissue destroyed l the violence of the injury.

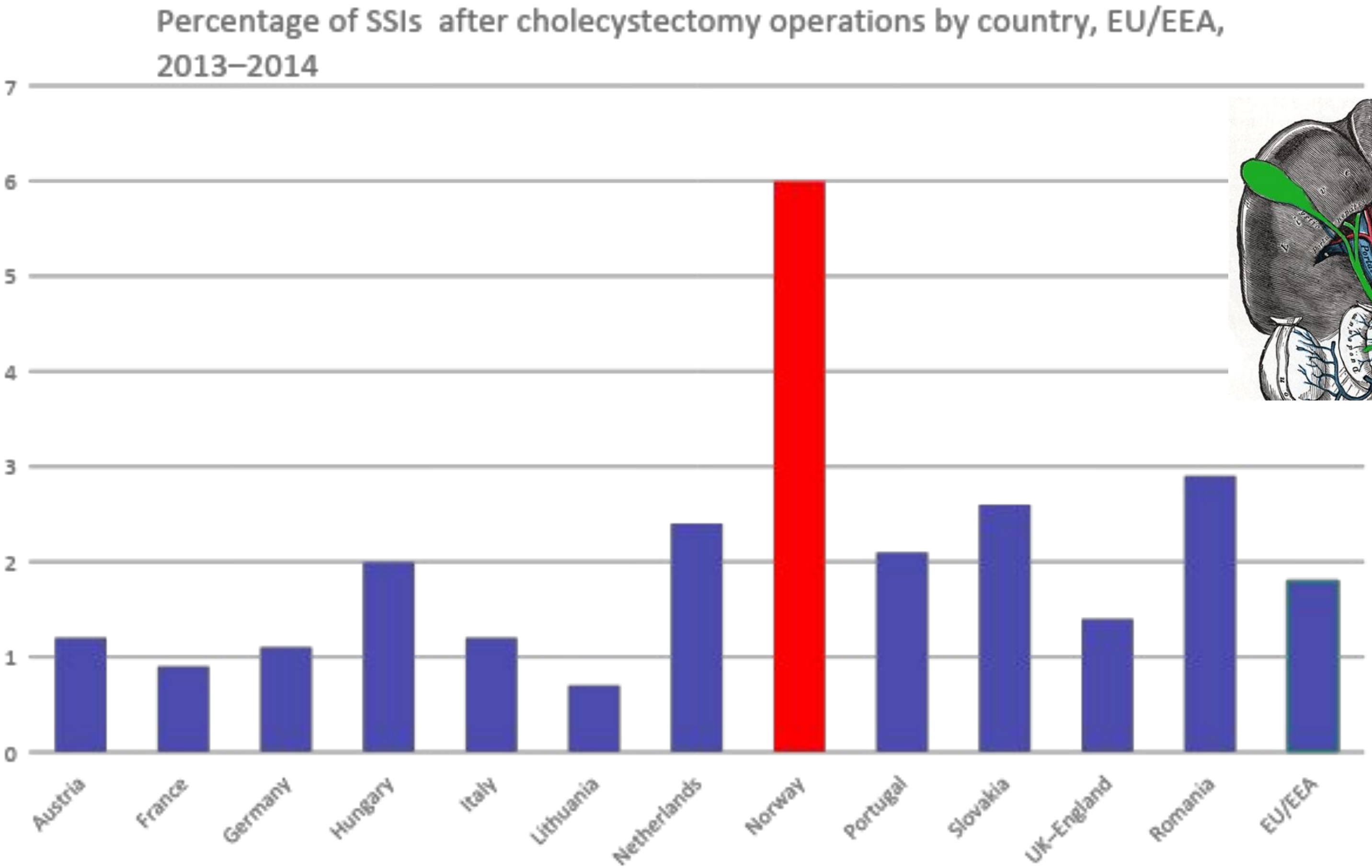
To prevent the occurrence of suppuration, with all its a

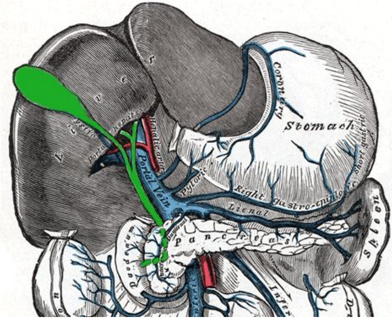
* A paper read before the British Medical Association in Dublin on the 9th of August, 1867.



Joseph Lister

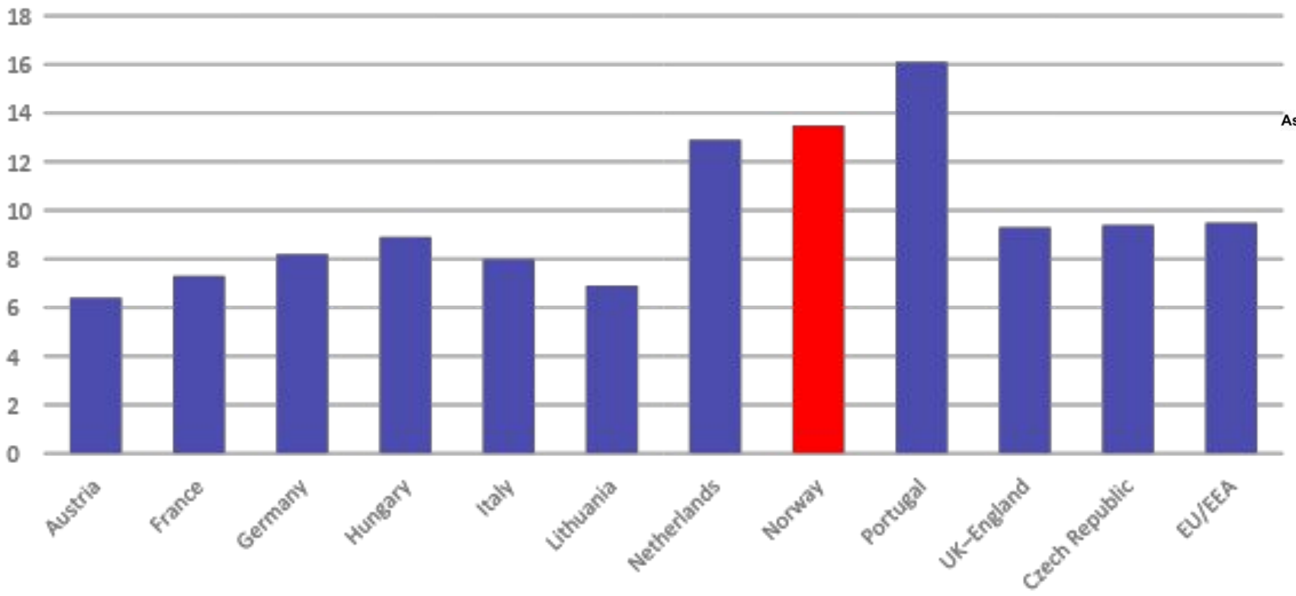

Gemelli
Gemelli
Gemelli
Gemelli

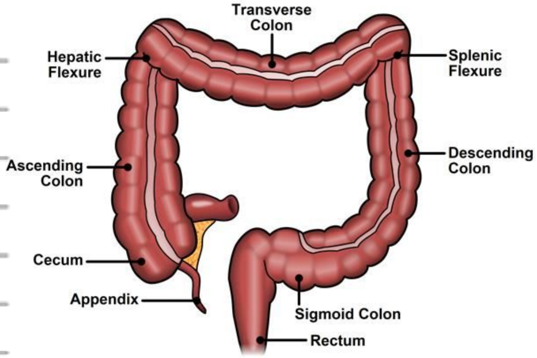




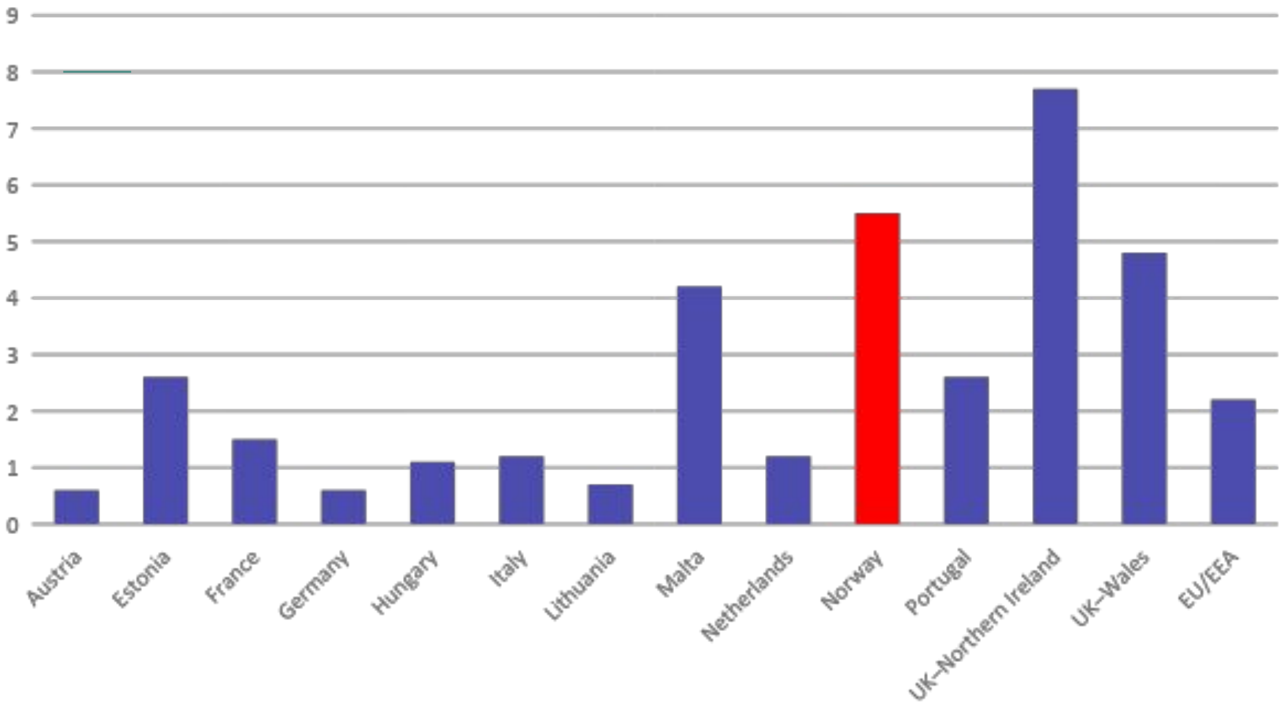
European Centre for Disease Prevention and Control. Annual Epidemiological Report 2016 – Surgical site infections. [Internet]. Stockholm: ECDC; 2017

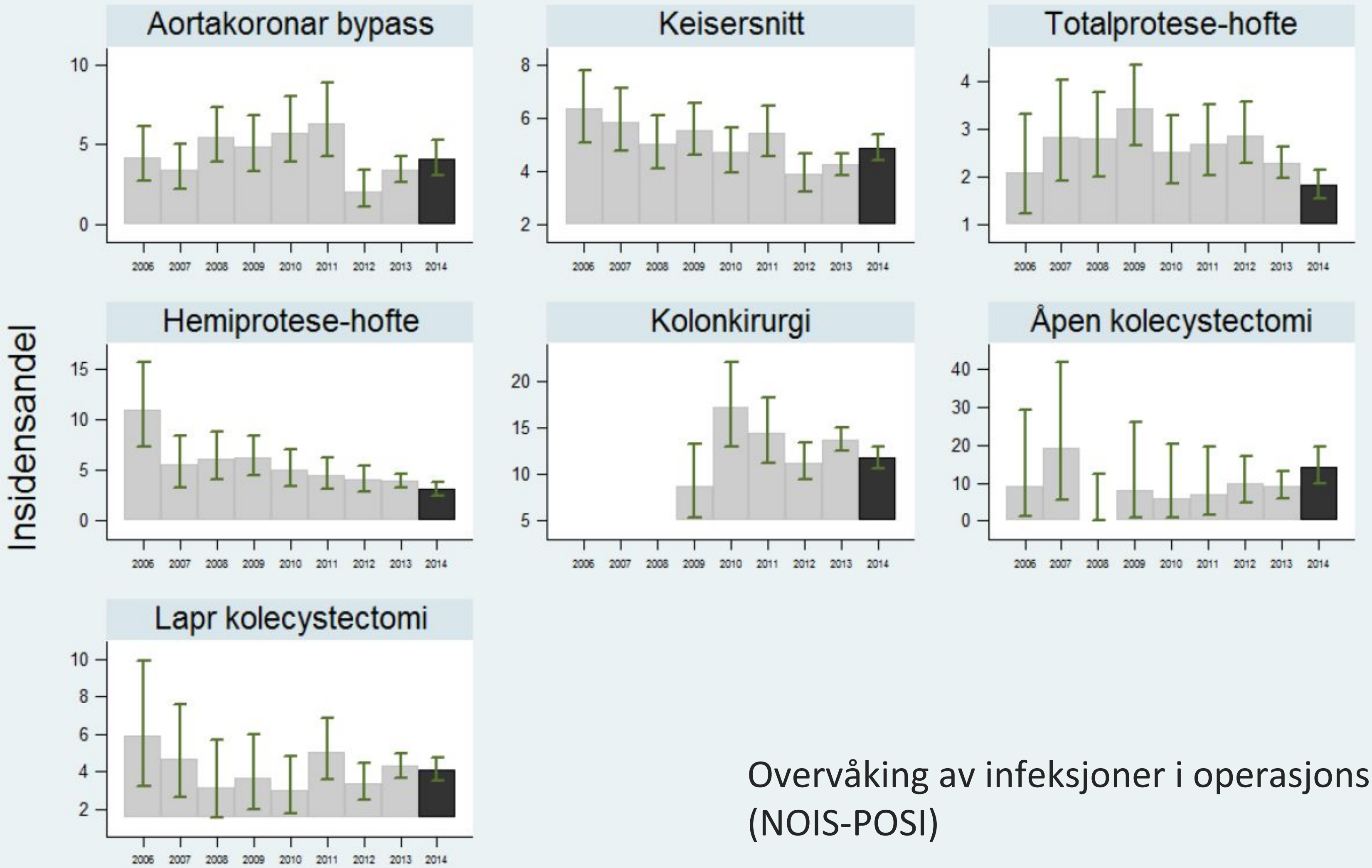
Percentage of SSIs after colon surgery by country, EU/EEA, 2013–2014





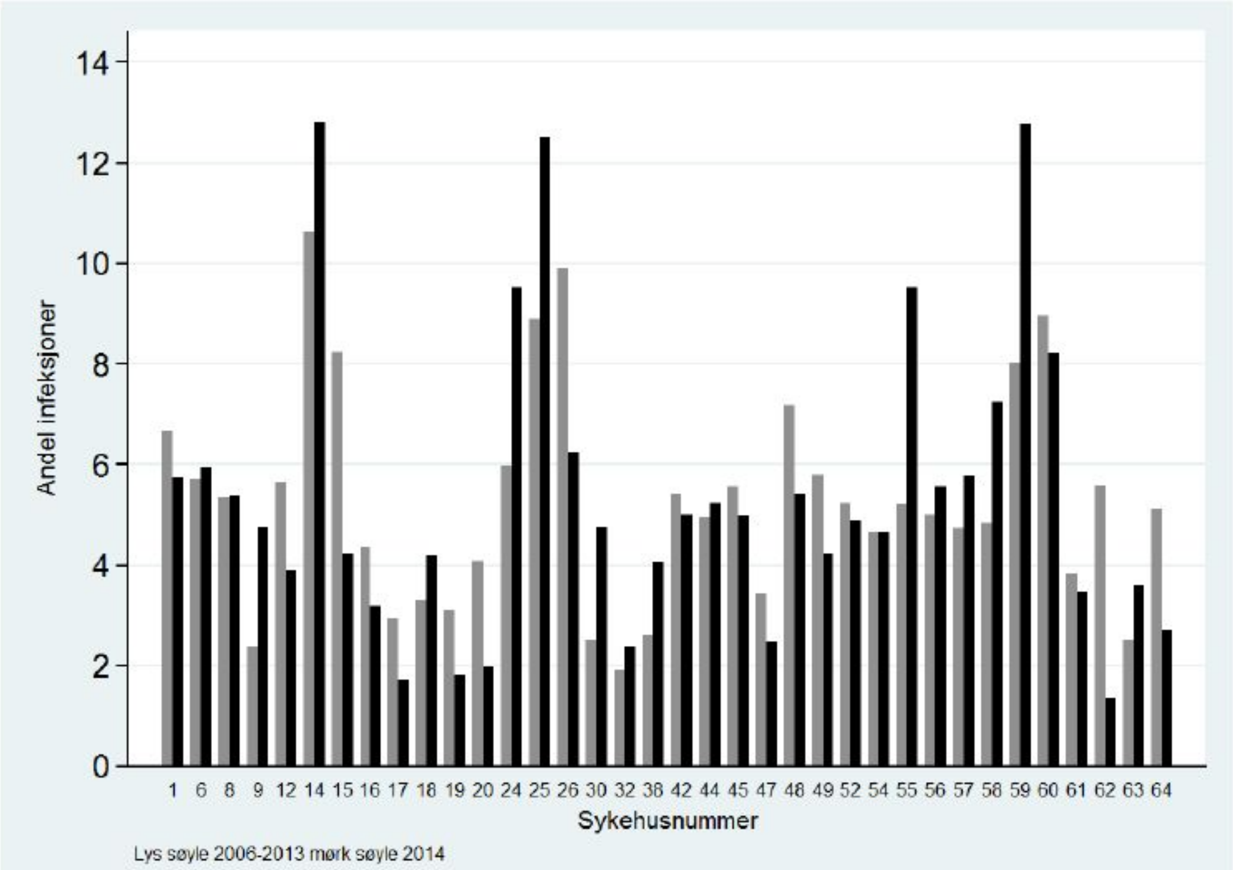
Percentage of SSIs after caesarean sections by country, EU/EEA, 2013–2014



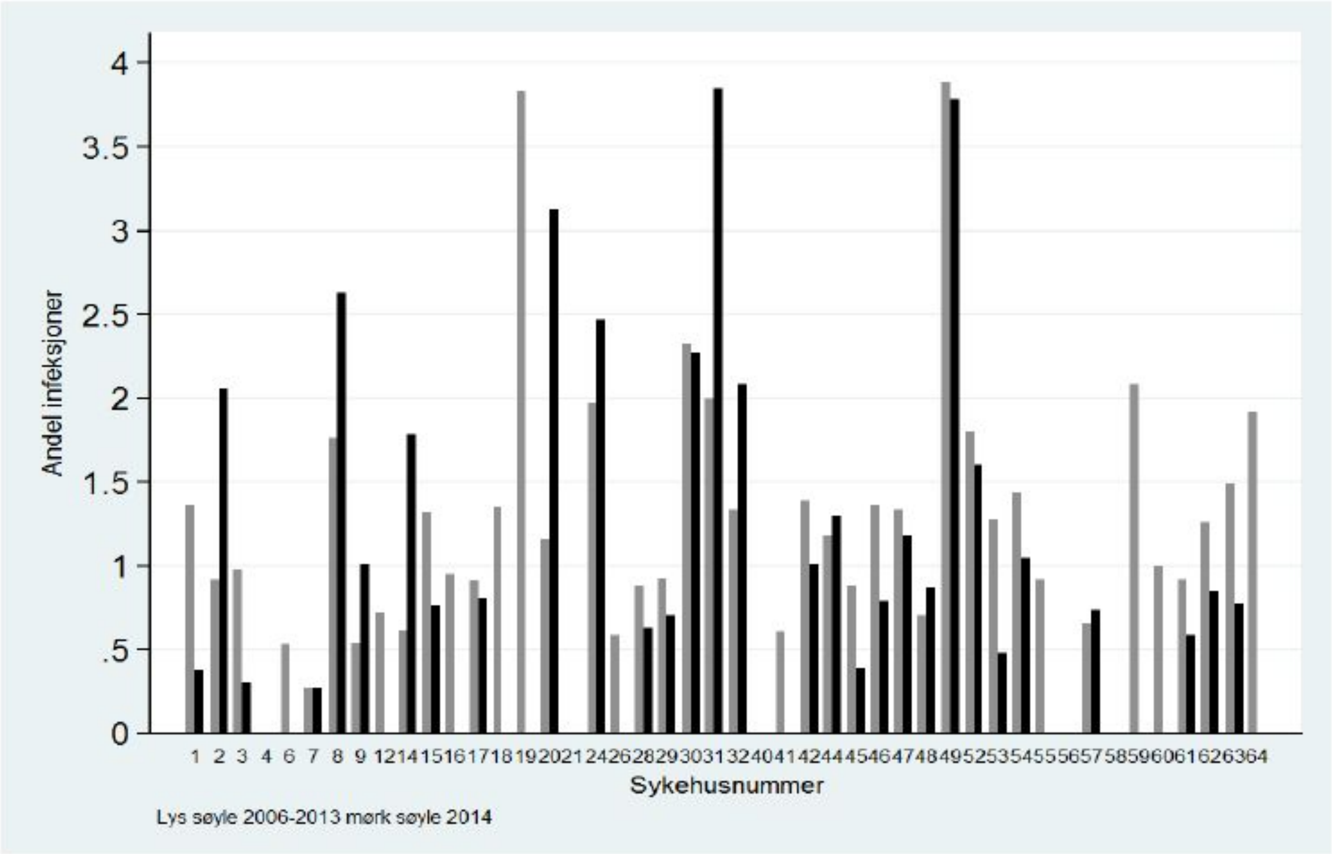


Overvåking av infeksjoner i operasjonsområdet (NOIS-POSI)

Figur 5 Insidensandel av alle infeksjoner etter keisersnitt per sykehus, 2006-2013 og 2014



Figur 8 Figur Insidensandel av dype infeksjoner etter totalprotese-hofte per sykehu
2006-2013 og 2014



"Although an SSI rate of zero may not be achievable, continued progress in understanding the biology of infection at the surgical site and consistent applications of proven methods of prevention will allow us to further reduce the frequency, cost, and morbidity associated with SSI."

Risk-factors of SSI

Patient

- Age
- Comorbidity
- Immunestatus
- Smoking
- Diabetes
- ……

Pathogen

- Resistence
- Virulence
- Evasion
- Biofilm
- ……

Hospital environment

- Lack of personell
- Lack of infection prevention
- Building hygiene
- CSSD

Risk-factors of SSI

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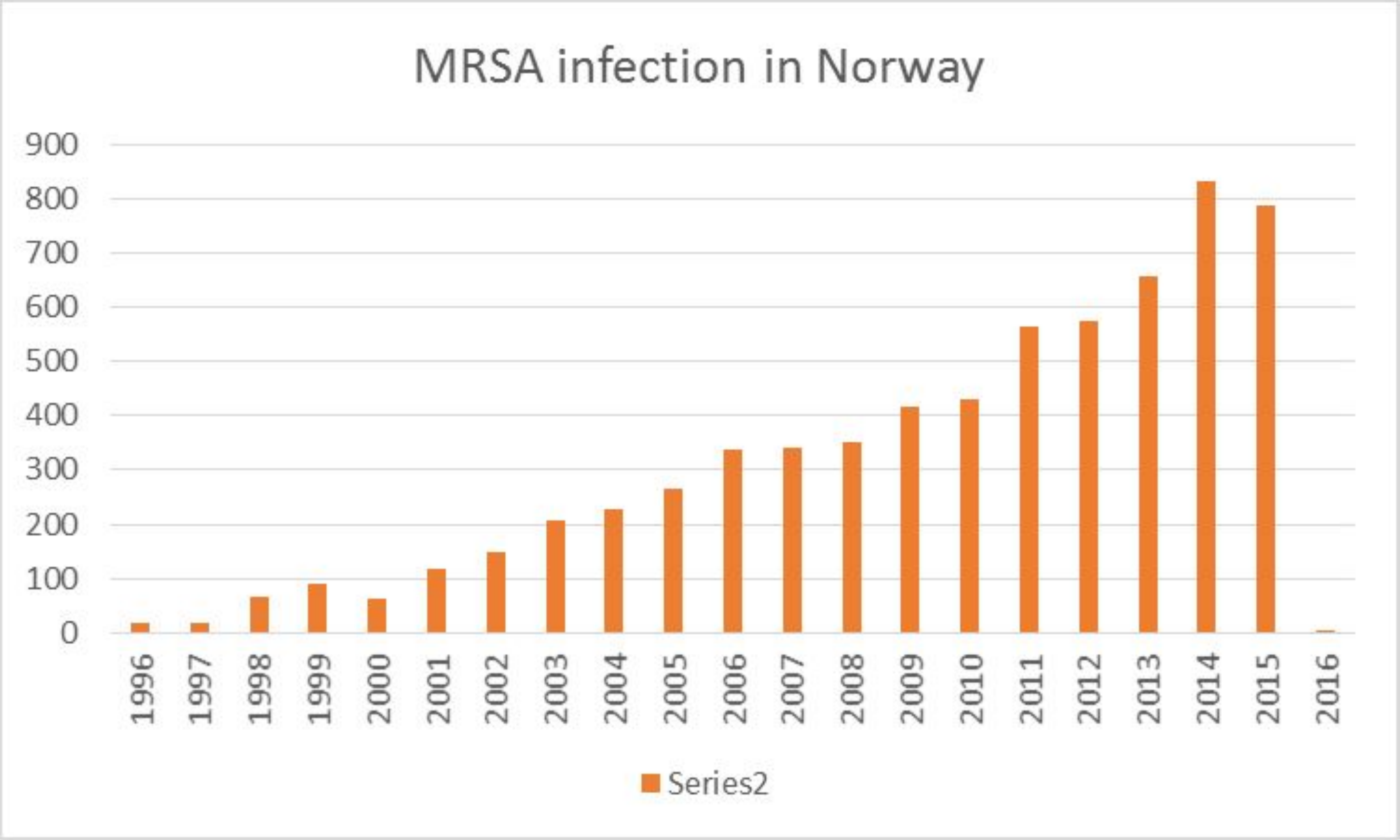
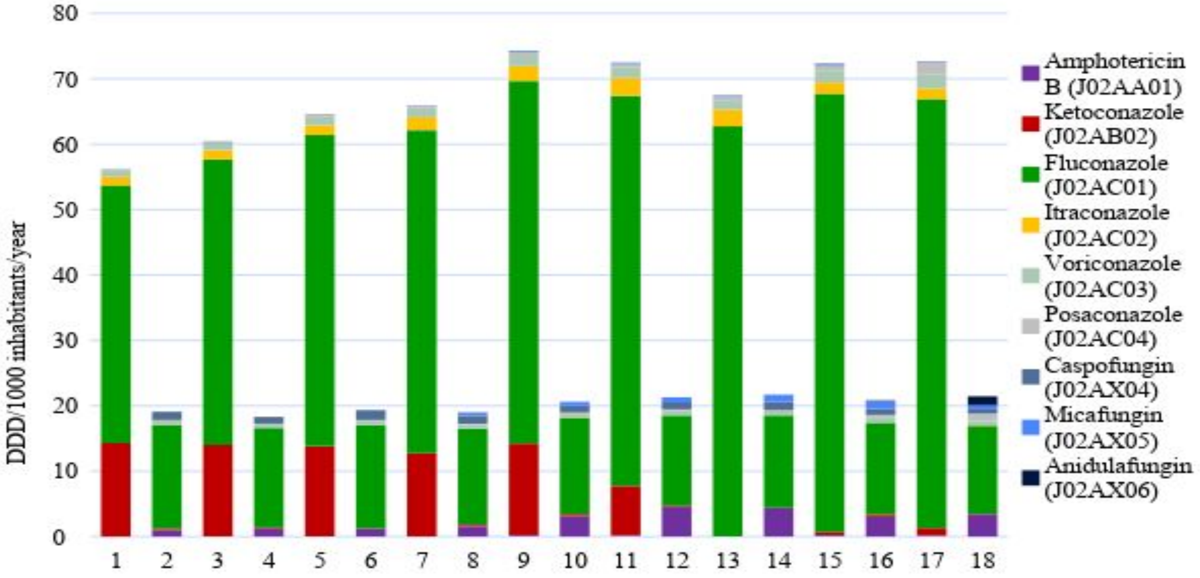
Risk-factors of SSI



Antimycotic usage in Norway (NORM-NORMvet 2016)



Proportions of antimycotics for systemic use in Norway for ambulatory care and hospitals 2008-2016, measured in DDD/1,000 inhabitants/year.

- The use of antimycotics for systemic use has been increasing in Norway, more so in ambulatory care than in hospitals

Risk-factors of SSI

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Patient Risk Factors

The growing number of immunocompromised

It's estimated that about 10 million people in the United States (3.6 percent of the population) are immunocompromised. But that's likely an underestimate because it only includes those with HIV/AIDS (diagnosed and undiagnosed), organ transplant recipients, and cancer patients; there's a sizable population that takes immunosuppressive drugs for other disorders such as rheumatoid arthritis and inflammatory bowel disease.

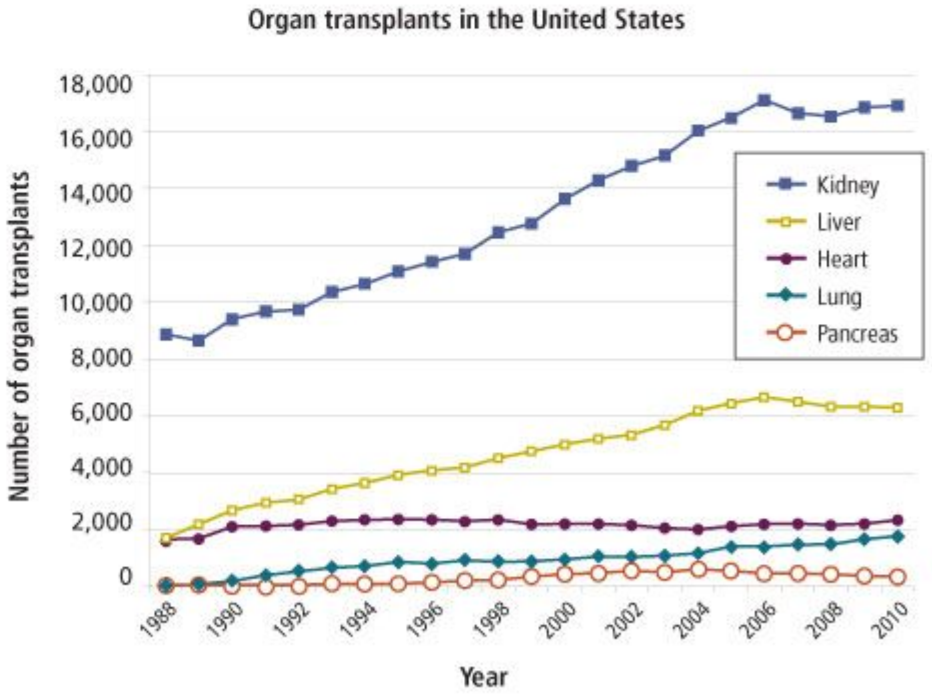
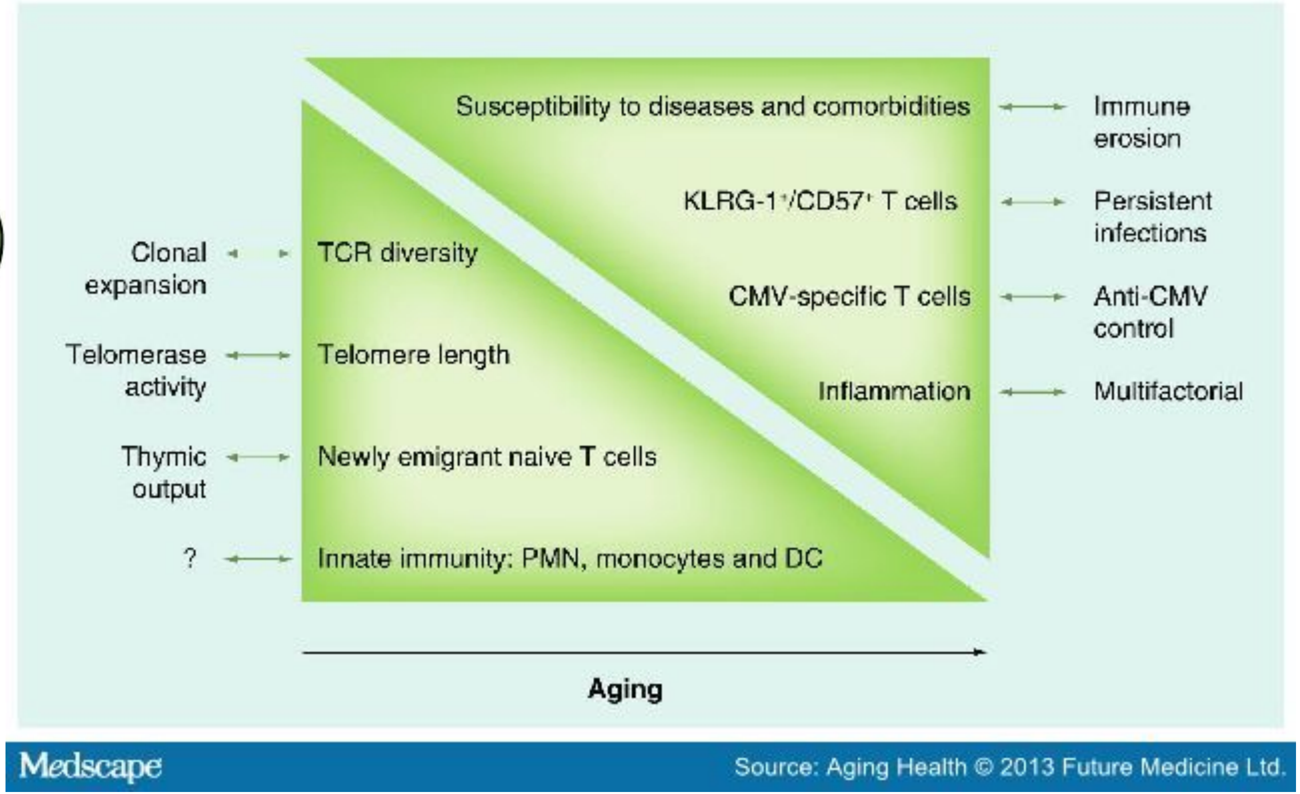
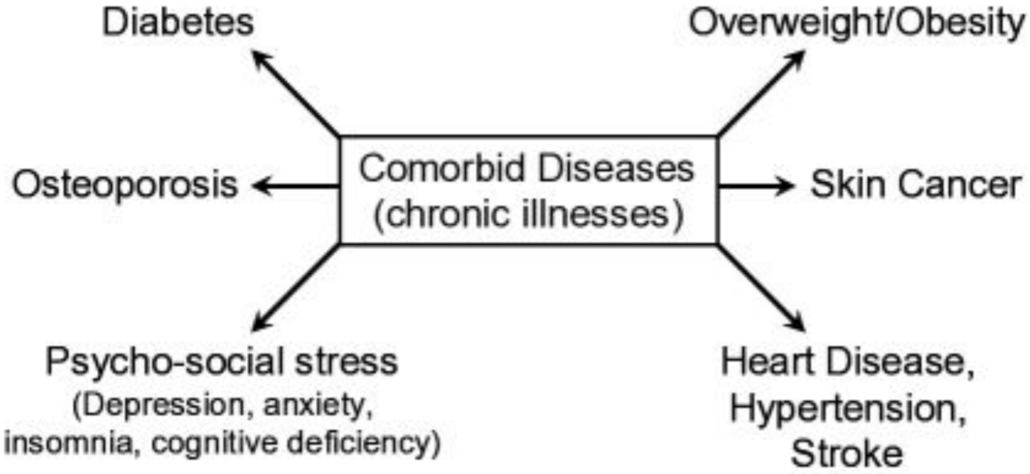


Figure 1. The number of organ transplants in the United States by organ type. (Figure is based on Organ Procurement and Transplantation Network data as of November 25, 2011.)

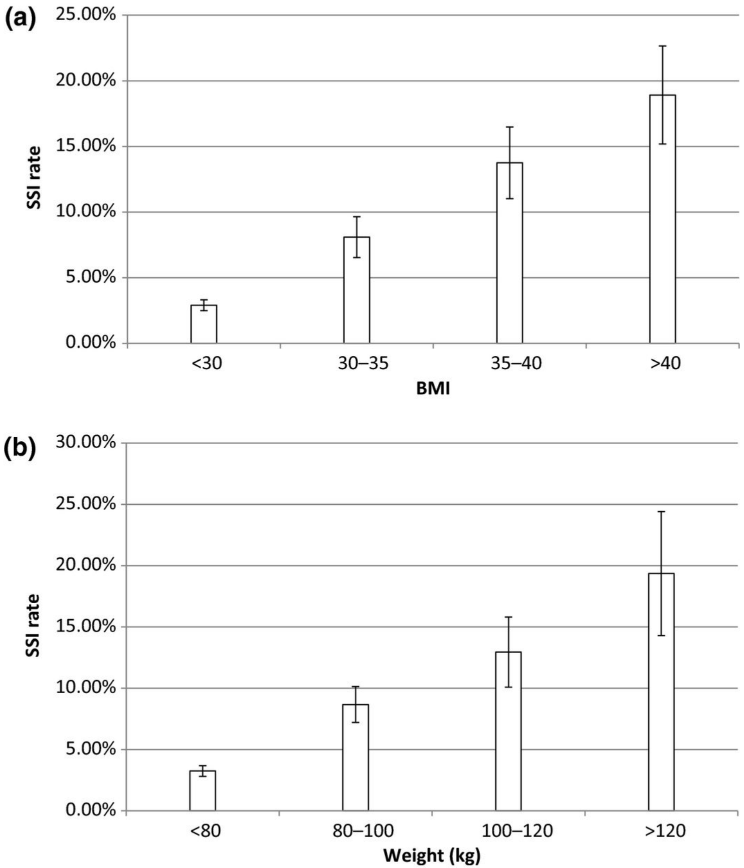
Age


Susceptibility to diseases and comorbidities
Immune erosion
KLRG-1+/CD57+ T cells
Persistent infections
CMV-specific T cells
Anti-CMV control
Inflammation
Multifactorial
Clonal expansion
TCR diversity
Telomerase activity
Telomere length
Thymic output
Newly emigrant naive T cells
?
Innate immunity: PMN, monocytes and DC
Aging
Medscape
Source: Aging Health © 2013 Future Medicine Ltd.

Comorbidity



Caesarean section wound infection & overweight



Australian and New Zealand Journal of Obstetrics and Gynaecology
21 DEC 2017 DOI: 10.1111/ajo.12755
http://onlinelibrary.wiley.com/doi/10.1111/ajo.12755/full#ajo12755-fig-0002

Nutritional support

“Elderly patients and those with poor ventricular function have increased morbidity and mortality rates when undergoing surgery. We aimed to ascertain whether an oral immune-enhancing nutritional supplement could improve preoperative host defence, and subsequently lower postoperative infections and organ dysfunction in patients undergoing elective cardiac surgery who are at high risk of infection.”

Table 4

Infectious morbidity

	Treatment (n=23)	Control (n=22)	p
One or more infections	4	12	0·013
Pneumonia	3*	9†	0·047
Urinary tract infection	2‡	1§	1·000
Wound infection	0	2‖	0·233
Days			
Temperature >38°C†	1·28†	1·27†	0·808

**Pseudomonas aeruginosa*, polymicrobial; †*Acinetobacter calcoaceticus*, *Proteus mirabilis*, anaerobes, *Haemophilus influenzae*, polymicrobial; ‡*Enterococcus* spp; §*Escherichia coli*; ‖*Streptococcus haemolyticus* group G, *Staphylococcus aureus*.

* *Pseudomonas aeruginosa*, polymicrobial;
† *Acinetobacter calcoaceticus*, *Proteus mirabilis*, anaerobes, *Haemophilus influenzae*, polymicrobial;
‡ *Enterococcus* spp;
§ *Escherichia coli;*
‖ *Streptococcus haemolyticus* group G, *Staphylococcus aureus.*

The Lancet 2001 358, 696-701DOI: (10.1016/S0140-6736(01)05836-6)

Staphylococcus aureus colonization, found in the noses of 20% to 30% of healthy humans, has been strongly implicated as a predictor of SSI involving this organism.

In people who are nasal carriers of *S. aureus*, the use of mupirocin ointment results in a statistically significant reduction in S. aureus infections.

Cochrane Library

Cochrane Database of Systematic Reviews

Mupirocin ointment for preventing Staphylococcus aureus infections in nasal carriers (Review)

van Rijen M, Bonten M, Wenzel R, Kluytmans J

Risk-factors of SSI

Patient

- Age
- Comorbidity
- Immunestatus
- Smoking
- Diabetes
- ……

Pathogen

- Resistence
- Virulence
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Hospital environment

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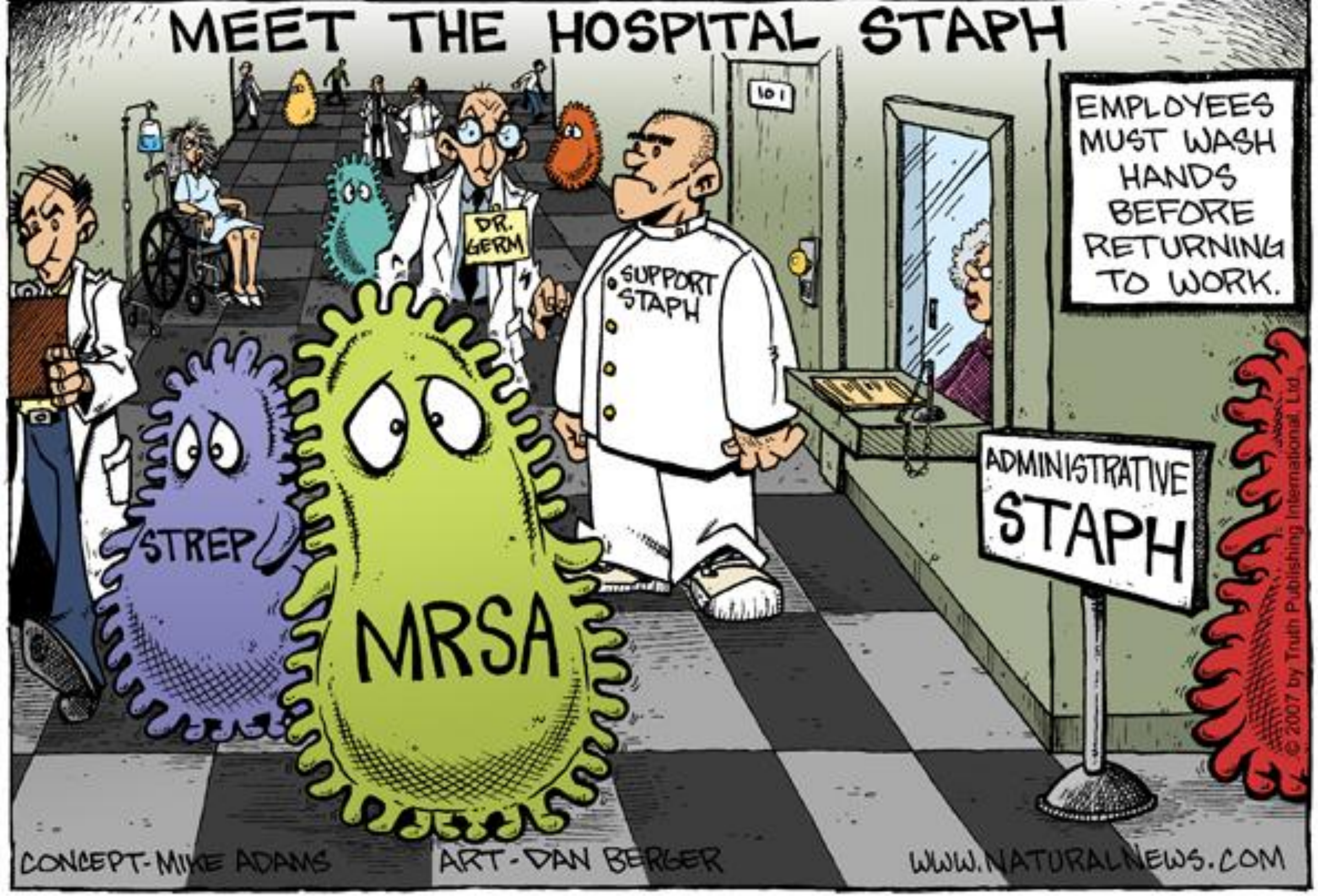
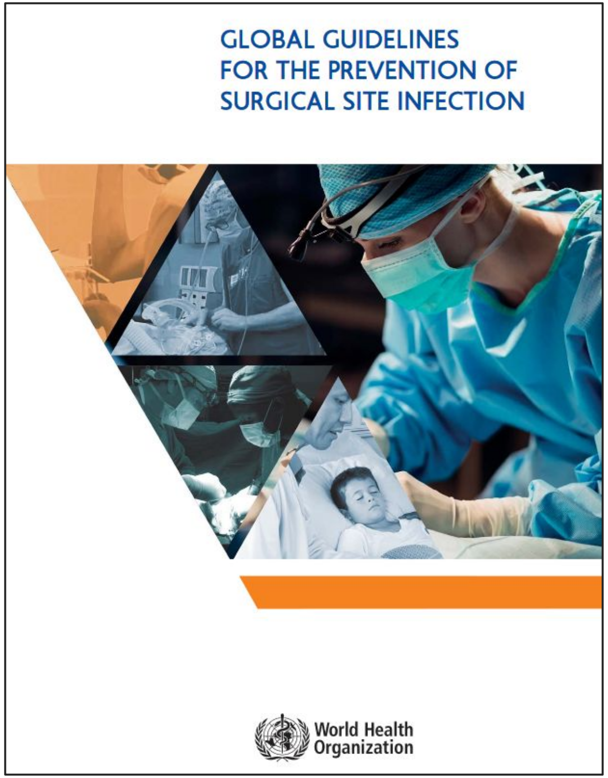
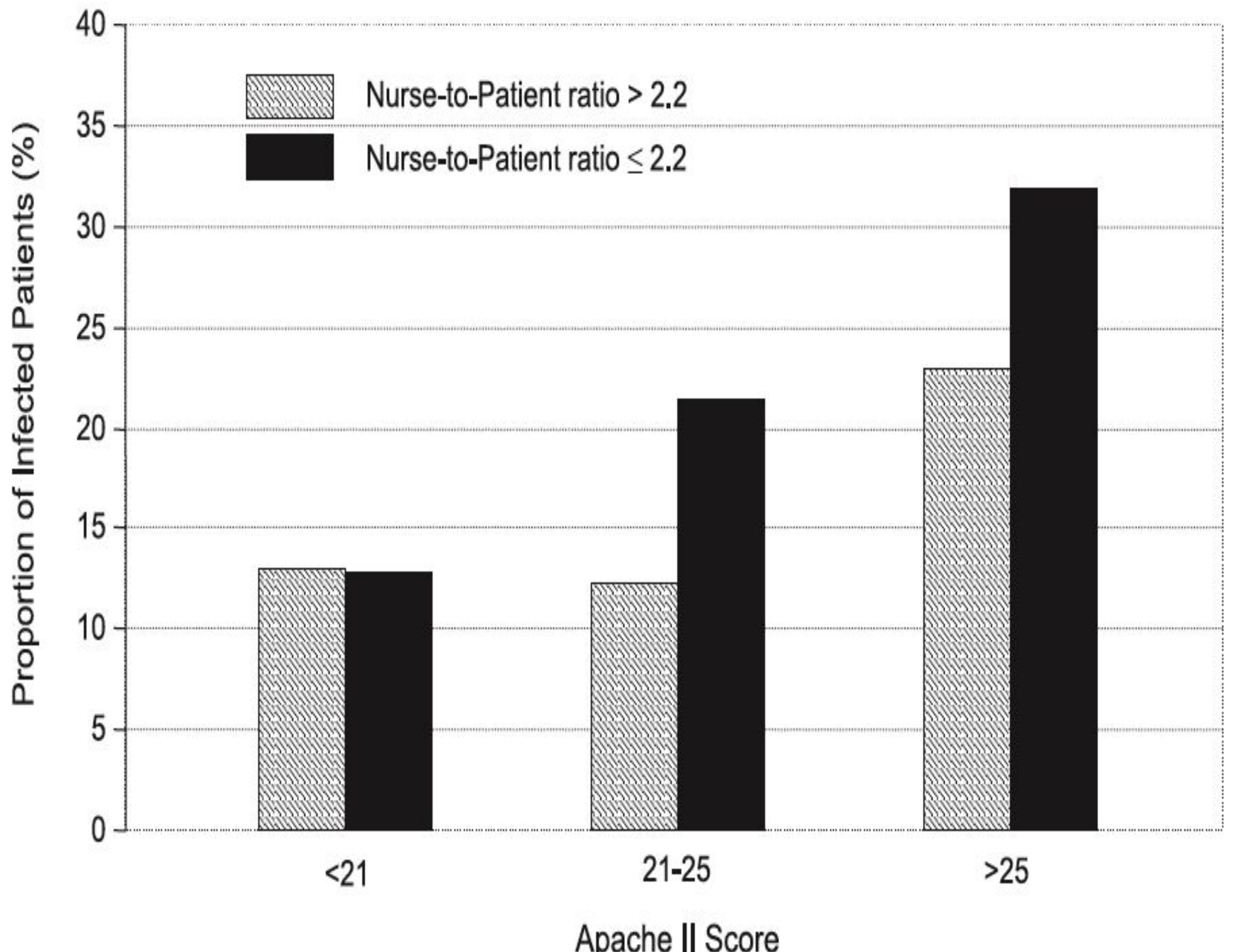

MEET THE HOSPITAL STAPH
101
EMPLOYEES MUST WASH HANDS BEFORE RETURNING TO WORK.
DR. GERM
SUPPORT STAPH
ADMINISTRATIVE STAPH
STREP
MRSA
© 2007 by Truth Publishing International, Ltd.
CONCEPT-MIKE ADAMS
ART-DAN BERGER
WWW.NATURALNEWS.COM

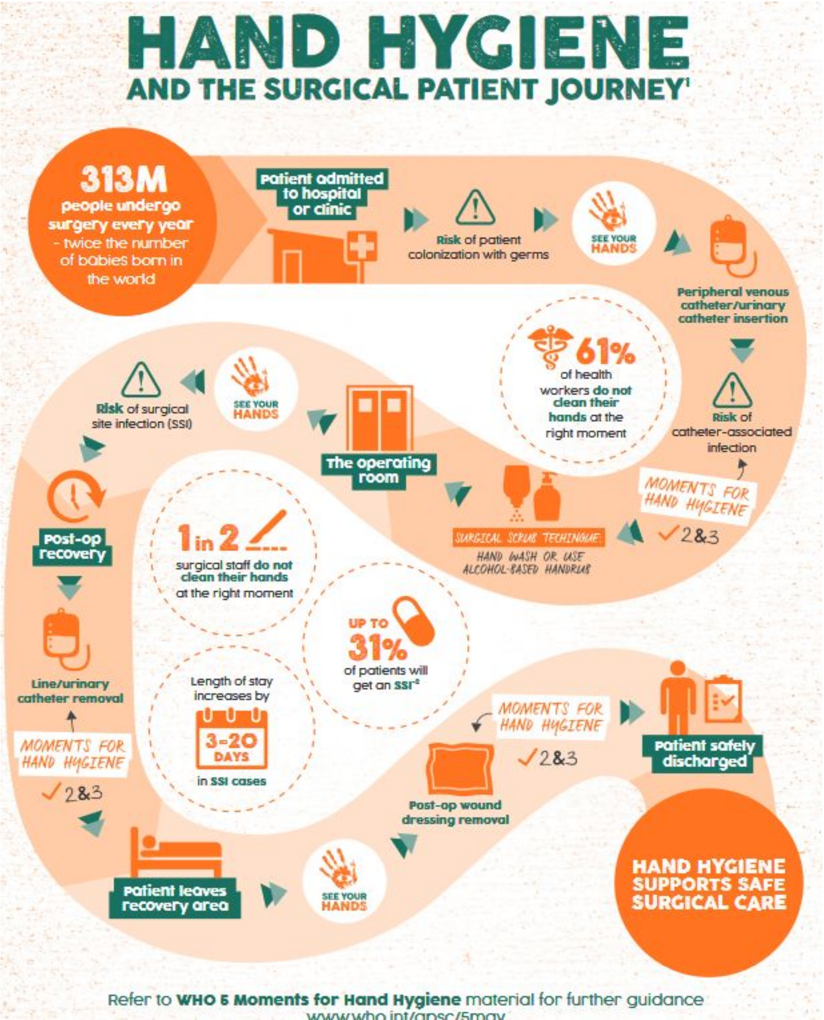
Surgical team



Compliance in Norway ?



Nurse-to-Patient ratio > 2.2
Nurse-to-Patient ratio ≤ 2.2
Proportion of Infected Patients (%)
40
35
30
25
20
15
10
5
0
<21
21-25
>25
Apache II Score

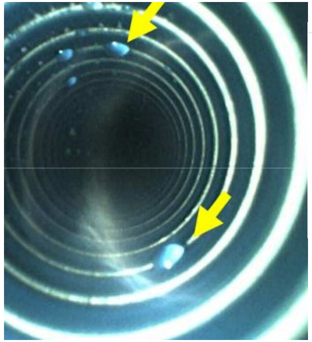


HAND HYGIENE
AND THE SURGICAL PATIENT JOURNEY[1]
313M people undergo surgery every year - twice the number of babies born in the world
Patient admitted to hospital or clinic
Risk of patient colonization with germs
SEE YOUR HANDS
Peripheral venous catheter/urinary catheter insertion
61% of health workers do not clean their hands at the right moment
Risk of catheter-associated infection
MOMENTS FOR HAND HYGIENE
2&3
SURGICAL SCRUB TECHNIQUE
HAND WASH OR USE ALCOHOL-BASED HANDRUB
The operating room
SEE YOUR HANDS
Risk of surgical site infection (SSI)
Post-op recovery
1 in 2 surgical staff do not clean their hands at the right moment
UP TO 31% of patients will get an SSI[2]
Line/urinary catheter removal
MOMENTS FOR HAND HYGIENE
2&3
Length of stay increases by 3-20 DAYS in SSI cases
MOMENTS FOR HAND HYGIENE
2&3
Patient safely discharged
Post-op wound dressing removal
Patient leaves recovery area
SEE YOUR HANDS
HAND HYGIENE SUPPORTS SAFE SURGICAL CARE
Refer to WHO 5 Moments for Hand Hygiene material for further guidance
www.who.int/gpsc/5may

Central Sterile Services Department (CSSD)/ Technical infection prevention

Dirty Devices Are a Growing Problem

Several recent outbreaks of infection with multi-drug resistant organisms related to duodenoscope use, suggest that the risk of infection-transmission during endoscopy may have been previously underestimated. Some of these outbreaks occurred despite reported adherence to reprocessing guidelines,…



ELSEVIER

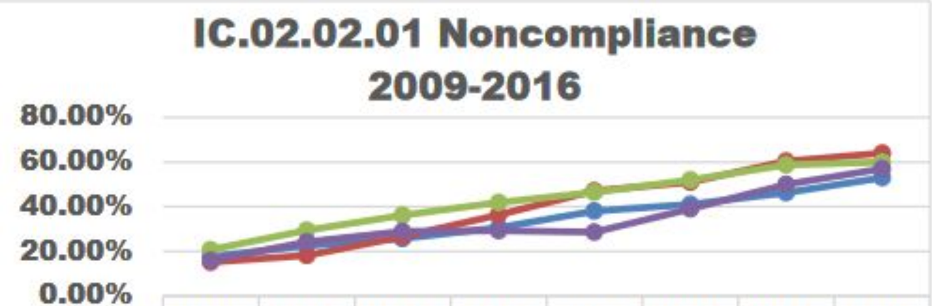
Gastrointestinal Endoscopy

Available online 6 February 2018

In Press, Accepted Manuscript

Scoping the scope: endoscopic evaluation of endoscope working channels with a new high-resolution inspection endoscope (with video)

Monique T. Barakat MD, PhD, Mohit Girotra MD, Robert J. Huang MD, Subhas Banerjee MD



	2009	2010	2011	2012	2013	2014	2015	2016
AHC	17.65	22.60	25.79	30.61	38.11	41.00	46.29	53.00
CAH	15.23	18.18	26.52	36.36	47.19	51.00	60.49	64.00
HAP	20.76	29.49	36.12	41.85	46.46	52.00	58.67	60.00
OBS	15.91	24.19	28.87	29.23	28.57	39.00	50.00	57.00

AHC, ambulatory care facility; CAH, critical-access hospital; HAP, hospital; OBS, office-based setting

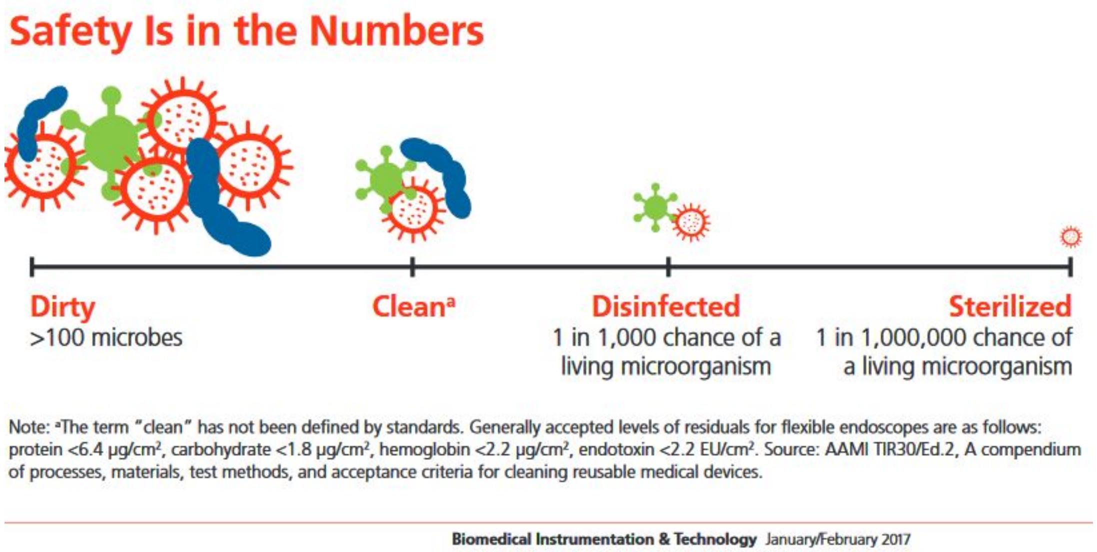
Standard IC.02.02.01 requires organizations to reduce the risk of infections associated with medical equipment, devices and supplies.

Causes of Transmission

- Environmental contamination
- Equipment
- Device integrity
- Inadequate preprocessing
- Failure in reprocessors
- Chemical failure
- Staff knowledge and training

"Everything we do in sterilization is based on probability, and it's all based upon everything along the entire system working properly. If any piece of it didn't, the probabilities are no longer as strong. One little thing goes wrong, and you're no longer at 99.9999%"

Donna Swenson, president and CEO of Sterile Processing Quality Services, Inc.



The Future of CSSD

- The complexity of medical devices and sterilization processes will continue to increase

- The demands placed on CSS-departments to do more with less will increase

- There will be increased attention brought to the profession in the media as well as surveying organizations

Instruments used during surgery, prior to reprocessing.

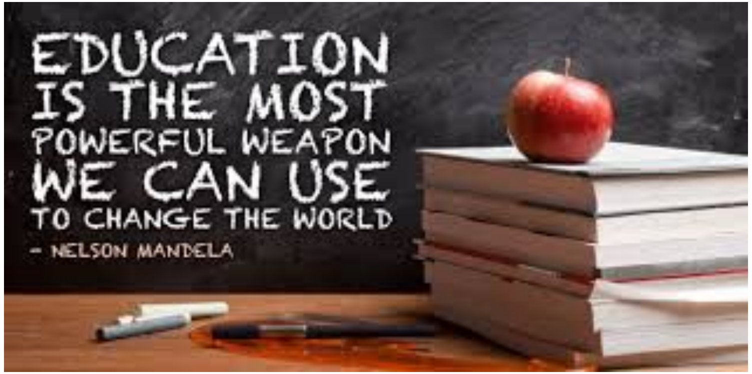
“Leadership support will play an important role in the implementation of quality systems in healthcare facilities, as it will require a commitment to education, training, and auditing the competency of employees, as well as providing the fundamentals and knowledge to assist with making challenging decisions”

Richard Schule, director of clinical education for STERIS Corporation

In some hospitals, sterile processing departments are viewed by hospital executives as a cost center. If the goal is to cut costs, sterile processing personnel will not have the resources they need.

How to proceed ?

The partnership among surgery, CSSD and Infection Prevention and Control must continue to develop



Infection Prevention and Control

The study program enables students to understand the microbiological and environmental factors that contribute to the incidence, prevalence, transmission and control of Healthcare-associated infections. Students will acquire the relevant skills required to ensure effective infectious prevention and control, and to ensure patient and public health protection in terms of hygiene and infection prevention.

APPLY FOR ADMISSION NOW

Campus	Study level	Closing dates	Credits	Start up
| Vestfold |	Continuing and further education	Application deadline 15 April 2018	Credits 40	Autumn 2018

University of Southeast Norway

1. sem (autumn)	2. sem (spring)	3. sem (autumn)	4. sem (spring)
1.gathering			
MICROBIOLOGY FOR HEALTHCARE PROFESSIONALS (10 ECTS.)	GENERAL INFECTION CONTROL, REGULATIONS AND ANTIBIOTIC STEWARDSHIP (10 ECTS.)	EPIDEMIOLOGY AND INFECTION CONTROL IN DIFFERENT CLINICAL DISCIPLINES (10 ECTS.)	INFECTION CONTROL IN SUPPLY AND DISPOSAL & DEVICE ASSOCIATED INFECTIONS (10 ECTS.)

University College
of Southeast Norway
Making healthcare safer