Mongolian Emergency Service
Hospital Hygiene Project
MeshHp.mn

Hospital hygiene in Mongolia – a look from outside

Mongolia 2012, May 11

Walter Popp, University Clinics Essen, Germany

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Hand hygiene

Vaccination against hepatitis B

Reprocessing of medical devices

Microbiologic diagnostics

Antibiotic policy

Next steps

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Hand hygiene

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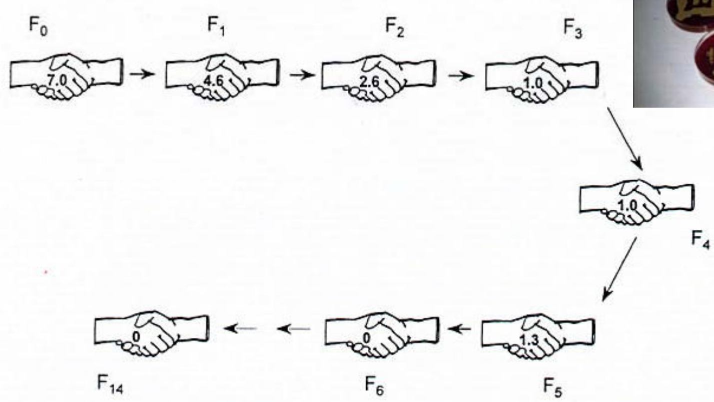

Distribution of phage contamination by hand giving (number = log10 of re-isolated amount of phages)

Von Rheinbaben, Wolff: Handbuch der viruswirksamen Desinfektionen. Springer, 2002, S. 272

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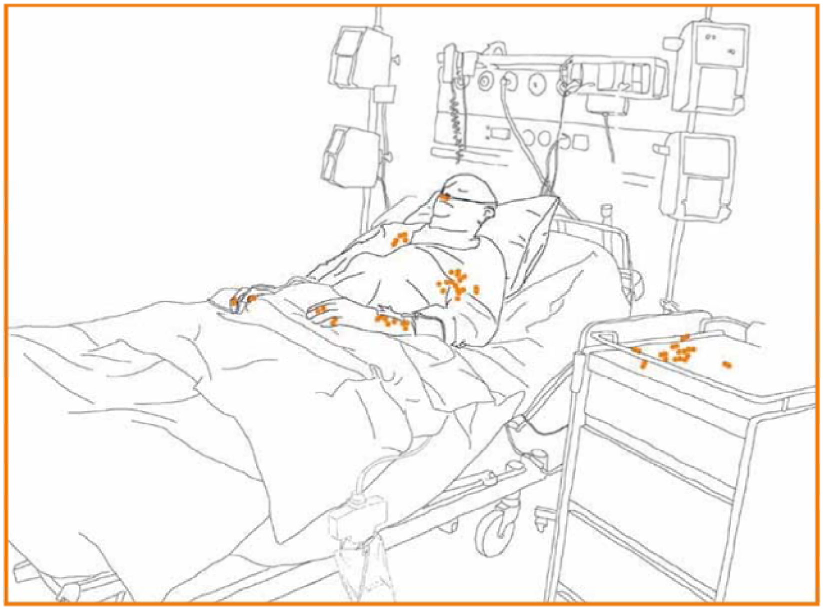
Organisms present on patient skin or the immediate environment

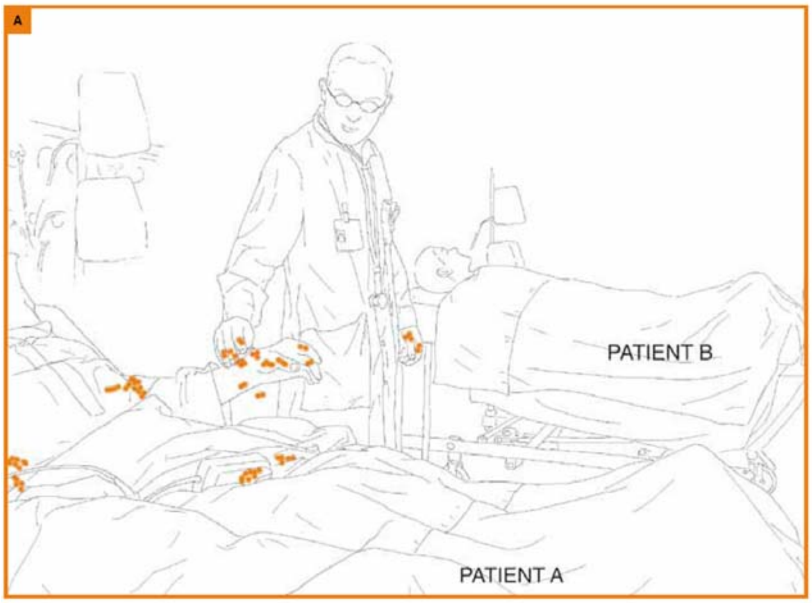


A bedridden patient colonized with Gram-positive cocci, in particular at nasal, perineal, and inguinal areas (not shown), as well as axillae and upper extremities. Some environmental surfaces close to the patient are contaminated with Gram-positive cocci, presumably shed by the patient. Reprinted from Pittet, 2006[885] with permission from Elsevier.

Organism transfer from patient to HCWs' hands

Contact between the HCW and the patient results in cross-transmission of microorganisms. In this case, Gram-positive cocci from the patient's own flora transfer to HCW's hands. Reprinted from Pittet, 2006[885] with permission from Elsevier.

Failure to cleanse hands results in between-patient cross-transmission*



(A) The doctor had a prolonged contact with patient A colonized with Gram-positive cocci and contaminated his hands. Reprinted from Pittet, 2006[485] with permission from Elsevier.

* The figure intentionally shows that long-sleeved white coats may become contaminated by microorganisms during patient care. Although evidence to formulate it as a recommendation is limited, long sleeves should be avoided.

TABLE 3. Studies comparing the relative efficacy (based on $\log_{10}$ reductions achieved) of plain soap or antimicrobial soaps versus alcohol-based antiseptics in reducing counts of viable bacteria on hands

Ref. no.	Year	Skin contamination	Assay method	Time (sec)	Relative efficacy
(*143*)	1965	Existing hand flora	Finger-tip agar culture	60	Plain soap < HCP < 50% EA foam
(*119*)	1975	Existing hand flora	Hand-rub broth culture	—	Plain soap < 95% EA
(*106*)	1978	Artificial contamination	Finger-tip broth culture	30	Plain soap < 4% CHG < P-I < 70% EA = alc. CHG
(*144*)	1978	Artificial contamination	Finger-tip broth culture	30	Plain soap < 4% CHG < 70% EA
(*107*)	1979	Existing hand flora	Hand-rub broth culture	120	Plain soap < 0.5% aq. CHG < 70% EA < 4% CHG < alc.CHG
(*145*)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
(*53*)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible] < 70% EA
(*108*)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
(*109*)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible] IPA = alc. CHG < alc. triclosan
(*146*)	1984	Artificial contamination	Finger-tip agar culture	60	Phenolic < 4% CHG < P-I < EA < IPA < n-P
(*147*)	1985	Existing hand flora	Finger-tip agar culture	60	Plain soap < 70% EA < 95% EA
(*110*)	[illegible]	Artificial contamination	Finger-tip broth culture	60	Phenolic < P-I < alc. CHG < n-P
(*93*)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible] = alc. CHG
(*61*)	[illegible]	Artificial contamination	Finger-tip broth culture	30	Plain soap < triclosan < P-I < IPA < alc. CHG < n-P
(*25*)	1991	Patient contact	Glove-juice test	15	Plain soap < IPA-E
(*148*)	1991	Existing hand flora	Agar-plate/image analysis	30	Plain soap < 1% triclosan < P-I < 4% CHG < IPA
(*111*)	1992	Artificial contamination	Finger-tip agar culture	60	Plain soap < IPA < EA < alc. CHG
(*149*)	1992	Artificial contamination	Finger-tip broth culture	60	Plain soap < 60% n-P
(*112*)	1994	Existing hand flora	Agar-plate/image analysis	30	Plain soap < alc. CHG
(*150*)	1999	Existing hand flora	Agar-plate culture	N.S.	Plain soap < commercial alcohol mixture
(*151*)	1999	Artificial contamination	Glove-juice test	20	Plain soap < 0.6% PCMX < 65% EA
(*152*)	1999	Artificial contamination	Finger-tip broth culture	30	4% CHG < plain soap < P-I < 70% EA

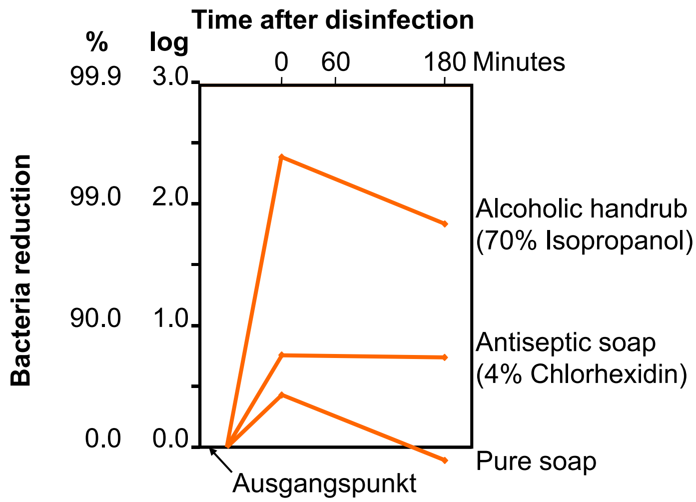
Note: Existing hand flora = without artificially contaminatiing hands with bacteria, alc. CHG = alcoholic chlorhexidine gluconate, aq. CHG = aqueous chlorhexidine gluconate, 4% CHG = chlorhexidine gluconate detergent, EA = ethanol, HCP = hexachlorophene soap/detergent, IPA = isopropanol, IPA-E = isopropanol + emollients, n-P = n-propanol, PCMX = chloroxylenol detergent, P-I = povidone-iodine detergent, and N.S. = not stated.

Hygienic hand disinfection reduces transient skin flora significantly more than hand washing.

Soaps are worse for skin than alcoholic handrub.

Boyce, Pittet: Guideline for hand hygiene in health-care settings: Recommendations of the healthcare infection control practices advisory committee and the HICPAC/SHEA/APIC/IDSA hand hygiene task force. Infect Control Hosp Epidemiol 23, 2002, suppl, S3-S40

Bacteria reduction on hands



Adapted from: *Hosp Epidemiol Infect Control*, 2nd Edition, 1999.

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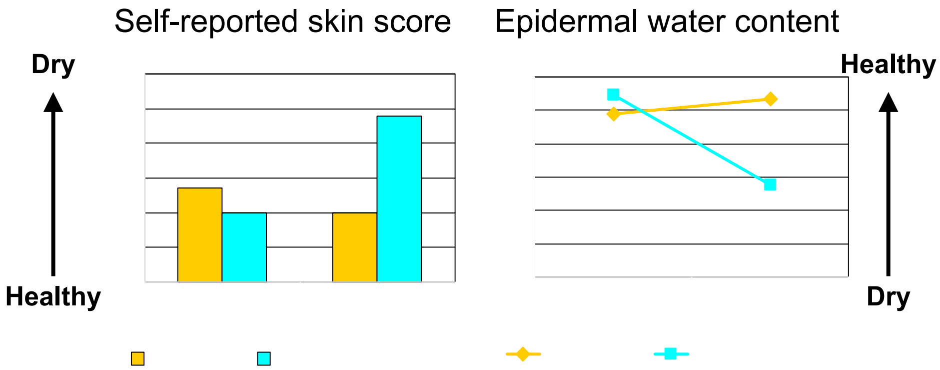
Effect of Alcohol-Based Handrubs on Skin Condition



~ Alcohol-based handrub is less damaging to the skin ~

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Boyce J, *Infect Control Hosp Epidemiol* 2000;21(7):438-441.

Intervention study of Pittet, Genf

Teaching hospital, Geneva, Switzerland.
Hand hygiene campaing 1994-1997.
Observational study re compliance.
Outcoume parameters: NI rates, MRSA, amount of hand disinfectants used.

Increase of compliance 48 % → 66 % (sign.)

Decrease of NI rates: 16,9 % → 9,9 % (sign.).

Decrease of MRSA infections: 2,16 → 0,93 per 10.000 patient days.

Amount of hand disinfectants used: 3,5 l → 15,4 l per 1.000 patient days.

Pittet et al: Effectiveness of a hospital-wide programme to improve compliance with hand hygiene. Lancet 356, 2000, 1307-1312

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Hand disinfection is extremely cheap in comparison to hospital infections!

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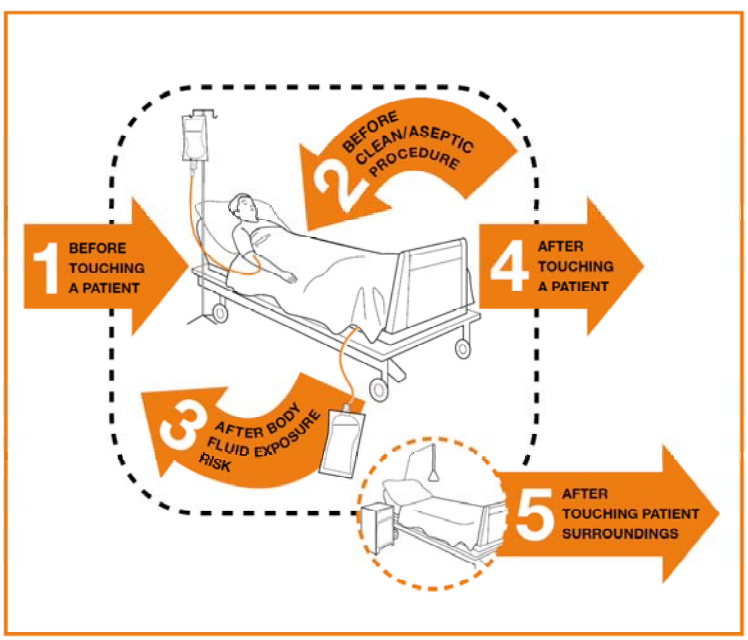
Unified visuals for "My five moments for hand hygiene"



The *patient zone*, *health-care area*, and *critical sites* with inserted time-space representation of "My five moments for hand hygiene" (Figure I.21.5b).
Reprinted from Sax, 2007[1] with permission from Elsevier.

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WHO-recommended handrub formulations

Formulation I

To produce final concentrations of ethanol 80% *v/v*, glycerol 1.45% *v/v*, hydrogen peroxide (H_2O_2) 0.125% *v/v*.

Pour into a 1000 ml graduated flask:

a) ethanol 96% *v/v*, 833.3 ml
b) H_2O_2 3%, 41.7 ml
c) glycerol 98% ,14.5 ml

Top up the flask to 1000 ml with distilled water or water that has been boiled and cooled; shake the flask gently to mix the content.

Formulation II

To produce final concentrations of isopropyl alcohol 75% *v/v*, glycerol 1.45% *v/v*, hydrogen peroxide 0.125% *v/v*:

Pour into a 1000 ml graduated flask:

a) isopropyl alcohol (with a purity of 99.8%), 751.5 ml
b) H_2O_2 3%, 41.7 ml
c) glycerol 98%, 14.5 ml

Top up the flask to 1000 ml with distilled water or water that has been boiled and cooled; shake the flask gently to mix the content.

Only pharmacopoeial quality reagents should be used (e.g. *The International Pharmacopoeia*) and not technical grade products.

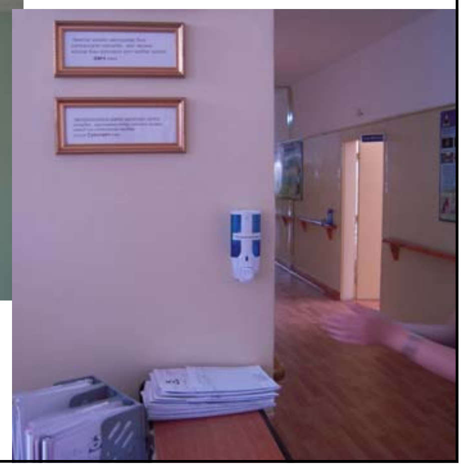
Production of alcoholic handrub solutions in 2 hospitals.

e.g. National Central Hospital: 1.052 l in 2011.

Production of alcoholic handrub solutions in 2 hospitals.

e.g. National Central Hospital: 1.052 l in 2011.

University Clinics of Essen: 1,300 beds -> 21 liters / bed and year.
National Central Hospital: 544 beds -> 11,500 liters a year.



Vaccination against hepatitis B

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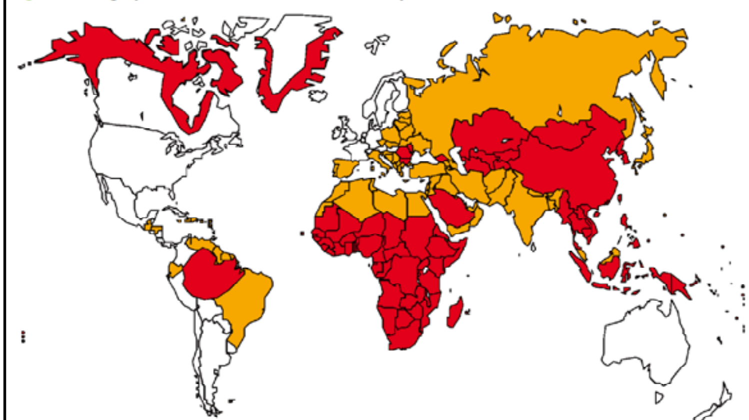
Figure 1. **Geographical distribution of HBV endemicity**



Red: High (HBsAg prevalence ≥8%

Orange: Intermediate (HBsAg prevalence 2%–7%)

White: Low (HBsAg prevalence <2%)

Source: World Health Organization. Introduction of hepatitis B vaccine into childhood immunization services. Management guidelines, including information for health workers and parents. Geneva: WHO; 2001.

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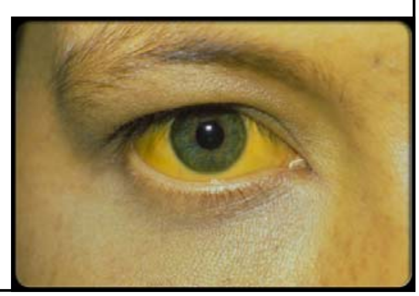
Main problem hepatitis B and C

10 – 30 % of Mongolians are virus carriers.

Primary liver cancer is most common cancer in both sex.

Very few adults vaccinated, even not in healthcare system.



Hepatitis B

- Vaccine against hepatitis B is available since1982

- Vaccine is 95 % effective in preventing HBV Infection

→ First vaccine against human cancer

-chronic hepatitis/cirrhosis/hepatocellular carcinoma is avoided

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Virus carriers					
year	**group**	**n**	**Hep. B**	**Hep. C**	**Ref.**
<1998	outpatients	150	28.7 %	48.0 %	Fujioka 1998
2002	adults	249	10 %	14 %	Takahashi 2004
2003	Blood donors	17,537	7.7 %	7.5 %	Oyunbileg 2004
2004	Blood donors	403	8.2 %	5.2 %	Tsatsralt 2005
2003-2005	adults	1.512		11.0 %	Baatarkhuu 2008
	nurses	96		20.8 %	
2004	Blood donors	17,000	8.3 %	8.7 %	Tserenpuntsag 2010
	Blood donors	923	7.8 %	9.6 %	
	18/19y males	96	19.8 %	5.3 %	
2009	army	> 550	15.5 %	2.0 %	Pers. communication

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Why are hepatitis B carriers more frequent?

The risk of transmission from an infected patient to a HCW by a needlestick injury:

30 % for hepatitis B

3 % for hepatitis C

0.3 % for HIV

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Virus carriers					
year	**group**	**n**	**Hep. B**	**Hep. C**	**Ref.**
2000	Children, 2 years old, vaccinated	148	Urban: 8.1 % Rural: 14.9 %		Edstam 2002
2004	School children, 7-12 years	1,145	5.2 %	0.6 %	Davaalkham 2006, 2007
2005-2006	Children, 0.3-15 years, mostly vaccinated	655	9.8 %	4.1 %	Tsatsralt-Od 2007

Estimation:
10 % non responders in children who might get pregnant
20 % HBsAg carriers in general
➔ 2 % of non responders might become a carrier
➔ the carrier % is much too high to be explained only by non responders

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Risks for getting a carrier

Nurses: high risk (Baatarkhuu 2008)
One pilot hospital: Surgery 34 %, sterilisation unit 41 %, engineers 25 % (pers. communication)

Pregnancy (Tserenpuntsag 2010)

Dental manipulation and surgery (Davaalkham 2006)

Hospitalisation as risk factor for children (Tsatsralt-Od 2007)

South-east Asia: 70 – 90 % of infants born to HBsAg/HBeAg-positive mothers become carriers (Ghendon 1987)

Estimation: 7 % HBsAg carriers in 18/19 years old women (Tserenpuntsag 2010)
➔5-7 % of babys might be infected
2.5 % < 10 years; 4.5 % teens; 10 % in 20es… (Baatarkhuu 2008)

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Vaccination of children – a success story?

Start of vaccination in 1991.

Complete vaccination in 7-12 years old children 60 % (Davaalkham 2007):
Metropolitan areas 75 %, rural areas 59 %,
1.2 % carriers (metropolitan), 8.6 % (urban) carriers in completely vaccinated children!
Only 17 % of all had protective anti-HBs antibodies (10 mIU/ml), decreasing with age

2 years old children (Edstam 2002):
95 % vaccinated, less completion in rural areas
Protective antibody levels (>10 mIU/ml) in 94 % (urban) and 70 % (rural)

5-10 years old children, vaccinated as infants (Ochirbat 2008):
Seroprotective antibodies only in 25 % at the age of ten

Low vaccination rate in young people (blood donors) – Tserenpuntsag 2010)

10 % not immune after vaccination (Baatarkhuu 2011, citation)

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Vaccination of children – a success story?

Start of vaccination in 1991:
The success might be better!

Less complete vaccination in urban areas,
High rate of non responders?

Need for re-vaccination in age of 10 years?

Problems with vaccines:
- Less success in rural areas if vaccinated in winter (Davaalkham 2007)
- Vaccines frozen in 20 % if transported to rural areas in winter (Edstam 2004)
- For example Engerix B:
  - Frozen not allowed (aluminiumhydroxid, also in HB Vax)
  - Storage between 8 – 25 ° C, usually 2 – 8° C
  - Temperatures up to 45° C seem not to be a problem (van Damme 1992)

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Presumed reasons for high hepatitis prevalence	
Blood products are not consequently tested – at least in countryside (Baatarkhuu 2011).	Only in countryside?
Use of one glas syringe for all family members in former decades (pers. communication). Self injection practice in families (Ochirbat 2008) Toothbrush sharing (Ochirbat 2008)	Not any longer ?
Insufficient reprocessing of medical devices, especially with dentists. Also virus positive dentists might infect patients – high rate of violations in dentistry.	Especially in coutryside? Infection by doctors during operations? Dentists, heart surgery? ➔ vaccinate, treat hepatitis!
Many iv applications of drugs in hospitals without real indications.	Reduce it, give more oral drugs
Bloodletting – kind of folk medicine in rural areas (Baatarkhuu 2011) Traditional medicine – acupuncture? Tattooing?	?
Pregnancy	Sexually transmitted or birth as risk?
Insufficient vaccination: Old vaccines? Temperature, transport and storage problems in countryside?	Seems possible
Sexual behaviour	?

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Lamivudin, perhaps life long
Tenofovir, elimination possible

Chronic hepatitis B can be treated by α-interferon (IFN- α; regular or pegylated) or nucleoside analogs. In properly chosen patients with chronic hepatitis B, 30%-40% will have a sustained virological response 6-12 mo after IFN-α treatment. More importantly, 30%-70% of the initial virological responders will clear serum HB-sAg on follow up. The wide range of HBsAg clearance

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TOPIC HIGHLIGHT

Francesca Cainelli, MD, Series Editor

Hepatitis B: Epidemiology and prevention in developing countries

Elisabetta Franco, Barbara Bagnato, Maria Giulia Marino, Cristina Meleleo, Laura Serino, Laura Zaratti

New cases of hepatitis per year / 100,000		
	HBV	HCV
Mongolia	27.7	4.7
Germany	0.9	6.6
	Reason: better hygiene and vaccination	Reason: no testing, no reporting

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Reprocessing of medical devices

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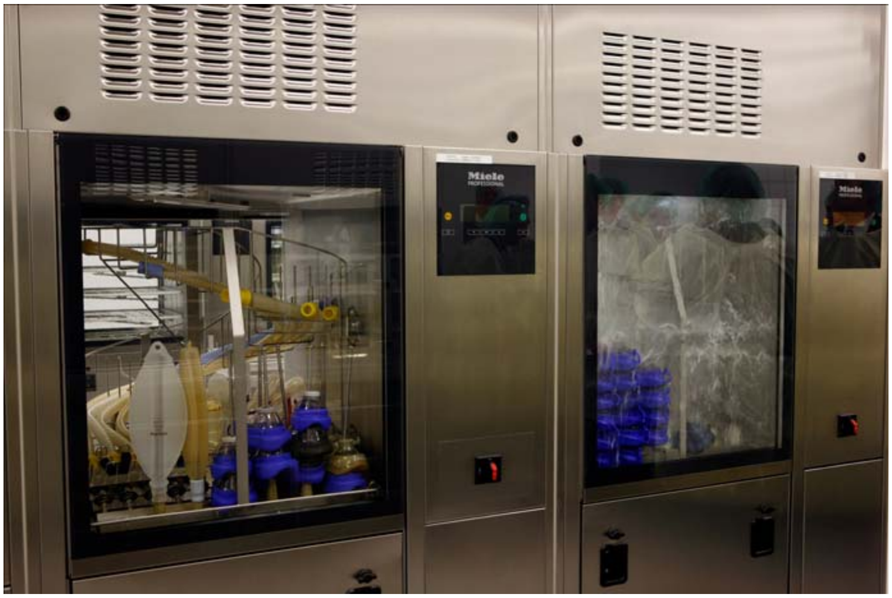

Modern washer disinfectors

MIC tray

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Washer disinfector for 2 endoscopes

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Dirty area: staff wears protective clothing

Classic container and vlies wrapping

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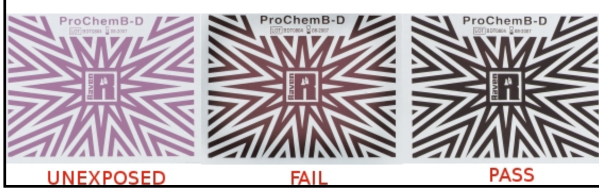
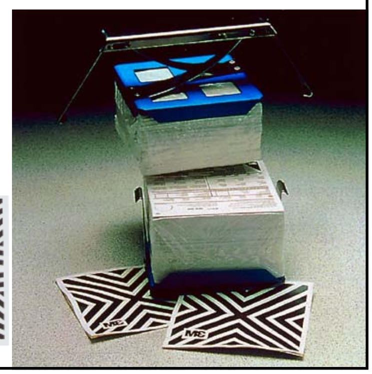
Sterilisers

Yearly maintenance

Control regularly:
Bowie Dick test daily
Bioindicators half year





Manual cleaning and disinfection

Can be improved.

Use a proven disinfectant with correct concentration, application time, lifetime.

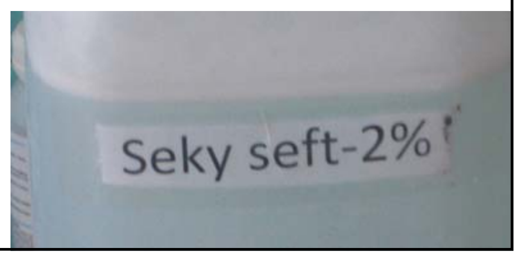
List of recommended disinfectants.

Sekusept active

Ecolab:
- Natriumpercabonate ➔ oxygen radicals
- also good cleaner

Order from May 2010:
- glutaraldehyde, formaldehyde, gliozsal

Very contradictory!



Brilliant

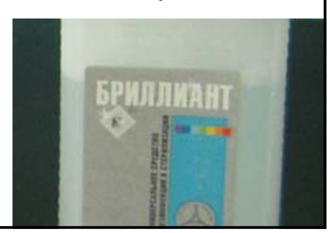
Russian disinfectant:
- alkyldimethylbenzylammonium chloride 0.9 %, Glutaricaldehyde 0.8 %
- 14 days if in closed container and in a dark place

Solution: 400 ml Brilliant for 10 l of water

For comparison:
Sekucid (Ecolab) contains 12 % Glutaral
- 4 % solution (30 minutes, virucidal) ➔ 0.5 % aldehyde

Gigasept FF (Schьlke) contains 12 % succinic acid dialdehyde
- 4 % solution (30 minutes) ➔ 0.5 % aldehyde.

Brilliant solution (400 ml in 10,000 ml water) ➔ 0.03 % aldehyde.
- Order from May 2010: disinfection with 0.8 – 1 % ➔ < 0.01 % aldehyde



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Machines

New sterilisers – autoclaves.
- BD test program – 3.5 minutes.
- Documentation.
- 134°C, 5 minutes

Washer disinfectors

Ultrasound
- Precleaning

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Machines

Modern reprocessing means more time for instruments!
- Ultrasound: 10 minutes
- Washer disinfector: 80 minutes
- Control and wrapping: 45 minutes
- Sterilisation: 2 hours
- At a whole: 4.5 hours – without any delay or break

At least 200 % more instruments needed!

Also maintenance of machines needed!

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Machines

Mod

At le

Also

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MMM Group

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MEIKO

German Healthcare Export Group

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Microbiologic diagnostics

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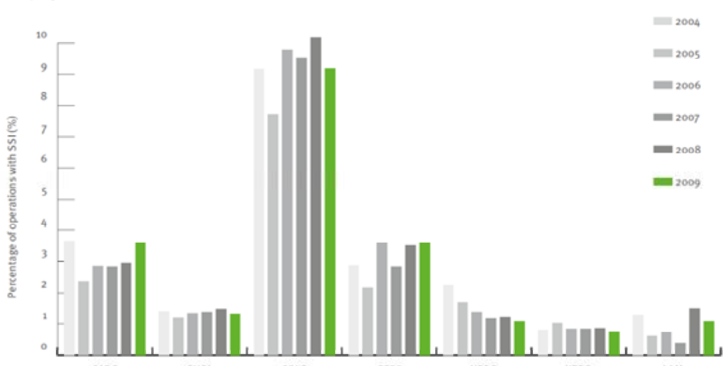
Figure 2.6.9. Trends in cumulative incidence of surgical site infections in Europe by category of surgical intervention, 2004–09



Source: HAI-Net SSI. CABG: coronary artery bypass graft; CHOL: cholecystectomy; COLO: colon surgery; CSEC: Caesarean section; HPRO: hip prosthesis; KPRO: knee prosthesis; LAM: laminectomy. Since data of all countries were pooled, methodological variations between and within countries may account for a part of the observed trends (see Discussion).

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Table 2.6.4. Ten most frequently isolated micro-organisms in ICU-acquired bloodstream infections by country, 2009

	Austria	Belgium	France	Germany	Italy	Lithuania	Luxembourg	Malta	Portugal	Slovakia	Spain	United Kingdom	Total
Number of isolates	280	130	902	1783	25	41	51	53	286	15	2298	83	5947
Coagulase-negative staphylococci	51.8%	17.7%	16.7%	28.5%	28.0%	26.8%	7.8%	5.7%	23.8%	20.0%	29.7%	26.5%	27.4%
Enterococcus spp.	10.4%	10.8%	7.2%	17.5%	8.0%	7.3%	17.6%	20.8%	8.0%	6.7%	10.2%	10.8%	12.0%
Staphylococcus aureus	6.4%	8.5%	13.4%	15.0%	0.0%	0.0%	9.8%	11.3%	12.2%	0.0%	4.7%	13.3%	9.9%
Pseudomonas aeruginosa	4.6%	11.5%	12.4%	4.6%	8.0%	4.9%	7.8%	35.8%	13.3%	26.7%	9.0%	3.6%	8.4%
Candida spp.	8.6%	13.1%	7.1%	7.5%	8.0%	0.0%	15.7%	3.8%	8.0%	0.0%	8.3%	4.8%	7.9%
Klebsiella spp.	3.6%	10.8%	6.3%	5.6%	4.0%	14.6%	11.8%	7.5%	8.4%	13.3%	6.7%	9.6%	6.5%
Escherichia coli	3.9%	8.5%	11.3%	5.3%	0.0%	7.3%	13.7%	1.9%	4.9%	6.7%	4.7%	15.7%	6.1%
Enterobacter spp.	2.1%	10.0%	9.1%	3.9%	8.0%	4.9%	9.8%	3.8%	7.3%	0.0%	5.0%	1.2%	5.3%
Acinetobacter spp.	0.0%	0.8%	1.3%	0.8%	8.0%	17.1%	0.0%	0.0%	4.9%	13.3%	5.6%	0.0%	3.0%
Serratia spp.	0.4%	1.5%	1.9%	1.3%	8.0%	7.3%	0.0%	1.9%	2.8%	0.0%	2.8%	0.0%	2.0%

Source: HAI-Net ICU.

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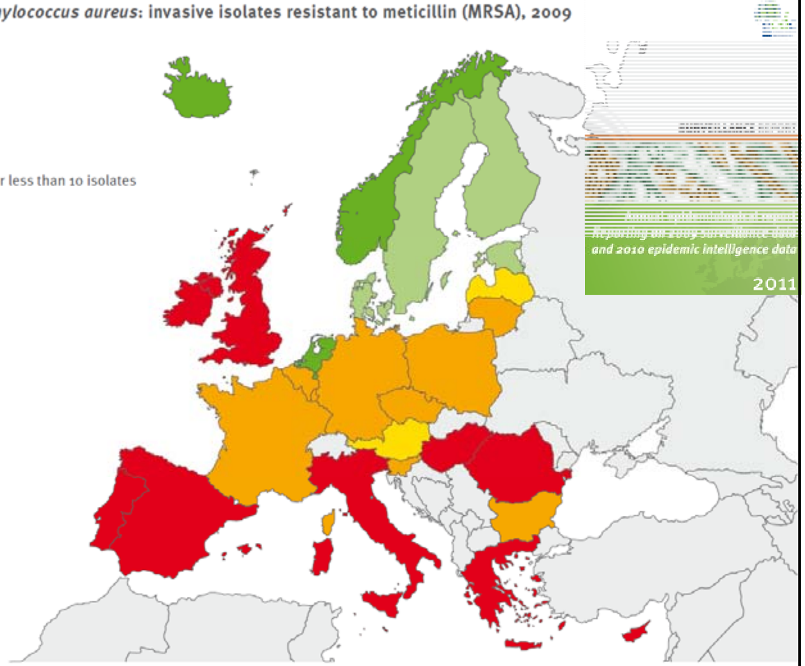
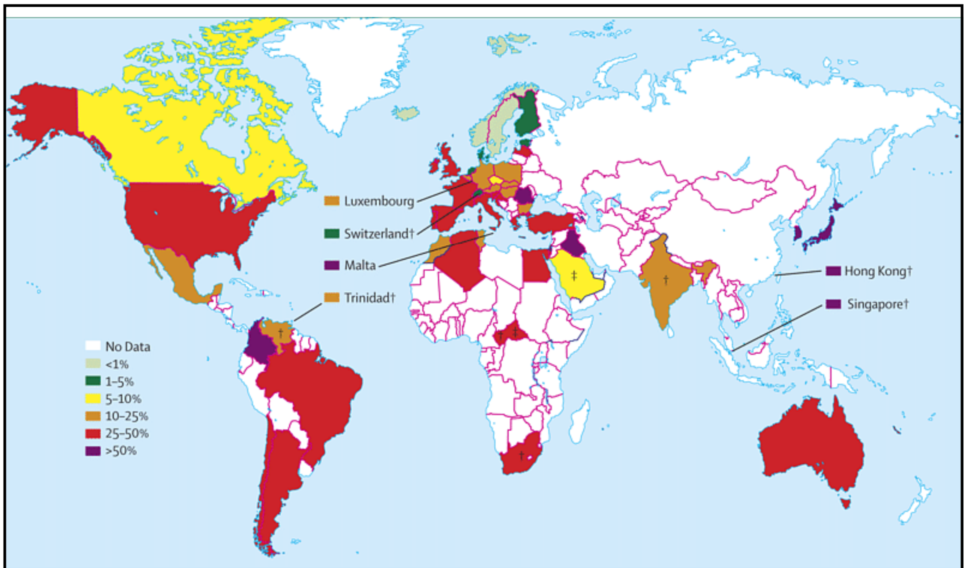
Figure 2.6.3. *Staphylococcus aureus*: invasive isolates resistant to meticillin (MRSA), 2009

- < 1%
- 1% to < 5%
- 5% to < 10%
- 10% to < 25%
- 25% to < 50%
- ≥ 50%
- No data reported or less than 10 isolates
- Not included



Non-visible countries
- Liechtenstein
- Luxembourg
- Malta

Source: EARS-Net. Only data from countries reporting more than 10 isolates are shown.



Weltweite Prдvalenz von MRSA
(Grundmann et al., Lancet 368, 2006, 874-885)

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MRSA in Mongolia?

Oral communication from PCR section of NRCID:
20 – 30 % MRSA, no numbers given
Ebright et al: Emerg Infect Dis 2003, 9, 1509

207 Staph. au. strains from Ulaanbaatar (2000-2002): n=6 (2.9 %)
Orth et al: Eur J Clin Microbiol Infect Dis 2006, 25, 104

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Prevalence of hospital-acquired infections and antibiotic use in two tertiary Mongolian hospitals

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Definitions

The current infection control guidelines in Mongolia lack standardised definitions for HAI. Therefore the US Centres for Disease Control and Prevention (CDC) definitions of HAI, widely utilised in similar studies, were used in the study for standardisation and comparison purposes.[8,10,11,15–17,20–22,24,25] These categorise 41 diagnostic groups which were classified as: (1) surgical site infection (SSI), (2) bloodstream infection (BSI), (3) urinary tract infection (UTI), (4) respiratory tract infection (RTI) and (5) other infection. All infections with onset >48 h after admission were recorded as HAI. SSI in surgical patients who were readmitted due to infection within one month of surgery or within one year after an implant was placed, were also classified as HAI. Surgical patients with a clean or clean-contaminated wound class and who had symptoms of infection were recorded as having HAI.[26] Patients with a contaminated or dirty-infected wound class were classified as having a community-acquired infection (CAI) together with all other infections. Antibiotic therapy was defined as prophylactic when it was prescribed to patients who had no progressive infections, including infectious comorbidities.

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Data collection

A one-day prevalence study was conducted during two consecutive weeks: the weeks starting 30 September 2008 in hospital A and 8 October 2008 in hospital B. On the study day, each of the 18 ICPs was designated 20–30 patients in surgical departments, intensive care and emergency units (IC&EU) or 30–40 patients in obstetrics and gynaecology (O&G), and medical departments.

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SUMMARY

Health statistics of Mongolia indicate that hospital-acquired infections (HAIs) occur in 0.01–0.05% of all hospital admissions. This is considerably lower than internationally reported rates. A one-day survey was conducted in two tertiary hospitals of Ulaanbaatar in September 2008 to estimate HAI prevalence, associated risk factors and patterns of antibiotic usage. Among 933 patients surveyed, 50 (5.4%) were diagnosed with HAI. Prevalence of surgical site infection was 1.1% (3.9% among surgical patients), bloodstream infection 0.3%, respiratory tract infection 1.3%, urinary tract infection 1.3%, and other HAI 1.4%. Microbiological investigations were only documented for 18.9% of all patients. A total of 558 patients (59.8%) were taking 902 courses of antibiotics; 92.1% of patients were prescribed antibiotics without a sensitivity test. Multiple logistic regression analysis revealed that HAI was significantly associated with the admission source, the hospital, length of hospital stay, surgical and other invasive procedures, urinary catheters and other indwelling devices. The study results were comparable with reports from some other developing countries and confirm that official statistics underestimate the true frequency of HAI in Mongolia.

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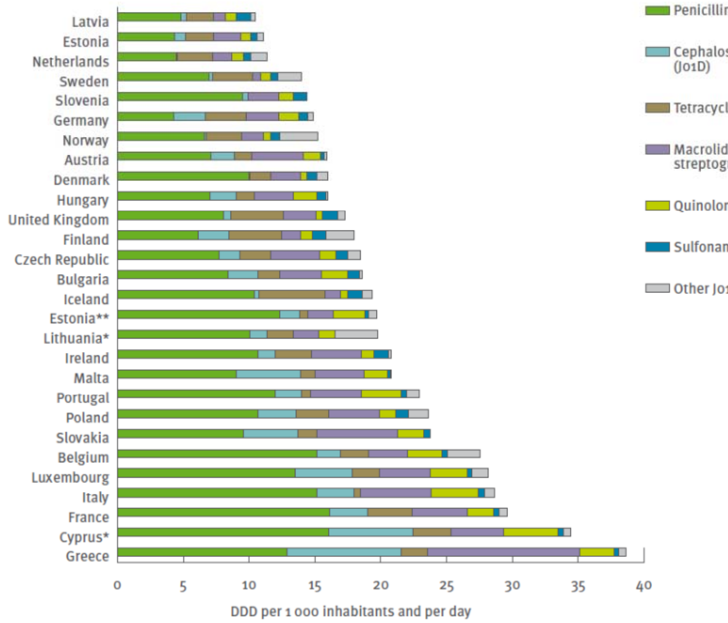
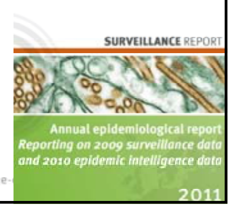
Microbiologic issue: start during September visit

Antibiotic policy

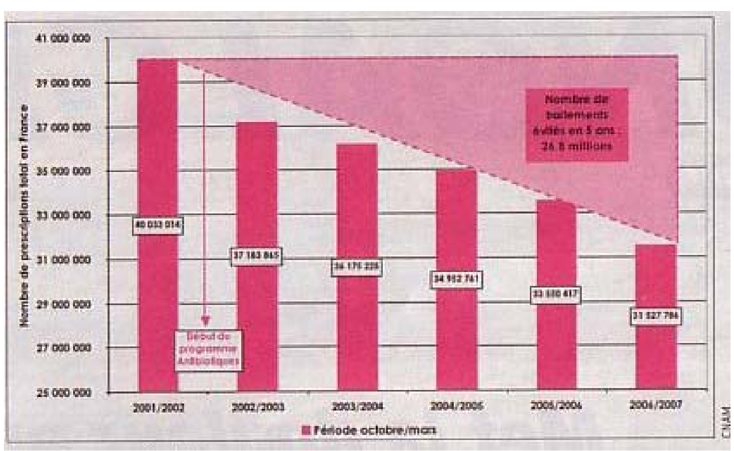
Figure 2.6.7. Outpatient antibiotic (ATC group J01) use subdivided into major antibiotic classes according to the Anatomical Therapeutical Chemical (ATC) classification, EU and EFA/EFTA countries, 2009





Source: ESAC. * Total use, i.e. including inpatients, for Cyprus and Lithuania. ** Reimbursement data, i.e. not including over-the-counter for Spain.

TOTAL ANTIBIOTIC COMSUMPTION in FRANCE



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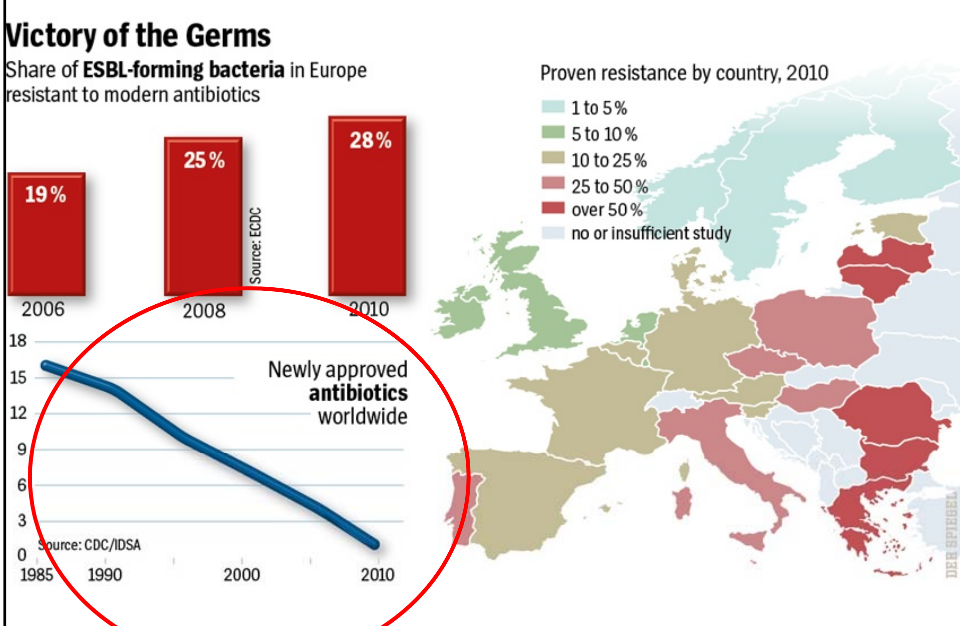

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Prevalence of hospital-acquired infections and antibiotic use in two tertiary Mongolian hospitals

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SUMMARY

Health statistics of Mongolia indicate that hospital-acquired infections (HAIs) occur in 0.01–0.05% of all hospital admissions. This is considerably lower than internationally reported rates. A one-day survey was conducted in two tertiary hospitals of Ulaanbaatar in September 2008 to estimate HAI prevalence, associated risk factors and patterns of antibiotic usage. Among 933 patients surveyed, 50 (5.4%) were diagnosed with HAI. Prevalence of surgical site infection was 1.1% (3.9% among surgical patients), bloodstream infection 0.3%, respiratory tract infection 1.3%, urinary tract infection 1.3%, and other HAI 1.4%. Microbiological investigations were only documented for 18.9% of all patients. A total of 558 patients (59.8%) were taking 902 courses of antibiotics; 92.1% of patients were prescribed antibiotics without a sensitivity test. Multiple logistic regression analysis revealed that HAI was significantly associated with the admission source, the hospital, length of hospital stay, surgical and other invasive procedures, urinary catheters and other indwelling devices. The study results were comparable with reports from some other developing countries and confirm that official statistics underestimate the true frequency of HAI in Mongolia.

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Antibiotic use

A total of 558 (59.8%) patients were taking 902 courses of antibiotics with the average number of antibiotics per patient being 1.62 (SD: 0.88; range: 1–6). In hospital A, 208 (51.4%) patients were taking 308 antibiotic courses with an average of 1.48 (SD: 0.75; range: 1–5) antibiotics per patient, whereas in hospital B, 350 (66.3%) patients were taking 594 courses with an average of 1.70 (SD: 0.94; range: 1–6) antibiotics per patient. At the time of the study, the mean duration of antibiotic therapy was 3.63 days (SD: 2.47; range: 0–14; median: 4.0) in hospital A, 3.71 days (SD: 3.21; range: 0–22; median: 3.0) in hospital B, and 3.68 days (SD: 2.90; range: 0–22; median: 3.0) overall.

Twenty-two types of antibiotic were administered to patients, the most common being ampicillin, gentamicin and cefazolin, together accounting for 72.2% of all antibiotics administered. The

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Next steps in project

Improve microbiology.

Get a picture about antibiotic policy.

Extend to countryside.
    e.g. by visits and train the trainers.

More prevalence data.

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ADB
Fifth health sector development project

Safe blood transfusions

Adequate medical waste management

Hospital hygiene and infection prevention and control

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Next steps – political issues

More money is needed in healthcare sector.
4.3 % of GDP in Mongolia
- US 15.4 %
- Germany 10.4 %
- Russia 5.4 %

New public hospitals – construction issue.

New machines – sterilisers, washer disinfectors, bedpan washers, ultrasound.
Maintainance must be available.
More Instruments and containers needed.

Antibiotics only on prescription by doctors in pharmacies.

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Mongolian Emergency Service
Hospital Hygiene Project
MeshHp.mn

Thank you for your attention!

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