INFECTION PREVENTION: Trends in Hand Hygiene

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Disclosure

- I work for GOJO Industries-Europe Ltd, European subsidiary of GOJO Industries, Inc., USA, as the Regulatory Affairs Manager – Europe.
- GOJO is a leading manufacturer and marketer of skincare and hygiene solutions for away-from-home settings
- GOJO brands cover hand cleaning, hand washing, hand sanitisation and skincare
- However, ... not about GOJO's brands or products today
- It is about our COMMON GOAL – improving infection prevention and control practices

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What we will discuss

- Brief reminder – Hand hygiene – past & present
- Some important indices
- Product formats, any impact? – Gel, Foam, spray
- Where we are today? Alcohol Based Hand Rub (ABHR)
- Trends in health care acquired infection – UK
- Solution selection for hand hygiene? What matters?
- Current IPC challenges: Ebola virus & EV D68
- Q & A

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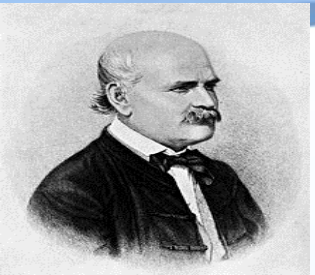
What we will discuss?

- EN Norms – European Test Standards
- The regulatory landscape in European
- Future and potential challenges
- What can we contribute as IPC professionals?
- Summary & conclusion
- Q & A

Brief Reminder – Hand Hygiene - Past & Present



1818 – 1865: Professor Ignaz Semmelweis – widely regarded as the Godfather of Hand Hygienic - be it posthumously, - established the principle of microbes as vehicle for diseases. Hungarian MD, worked in Vienna, Austria, died in Hungary. Use of chlorinated lime solution in hand hygiene

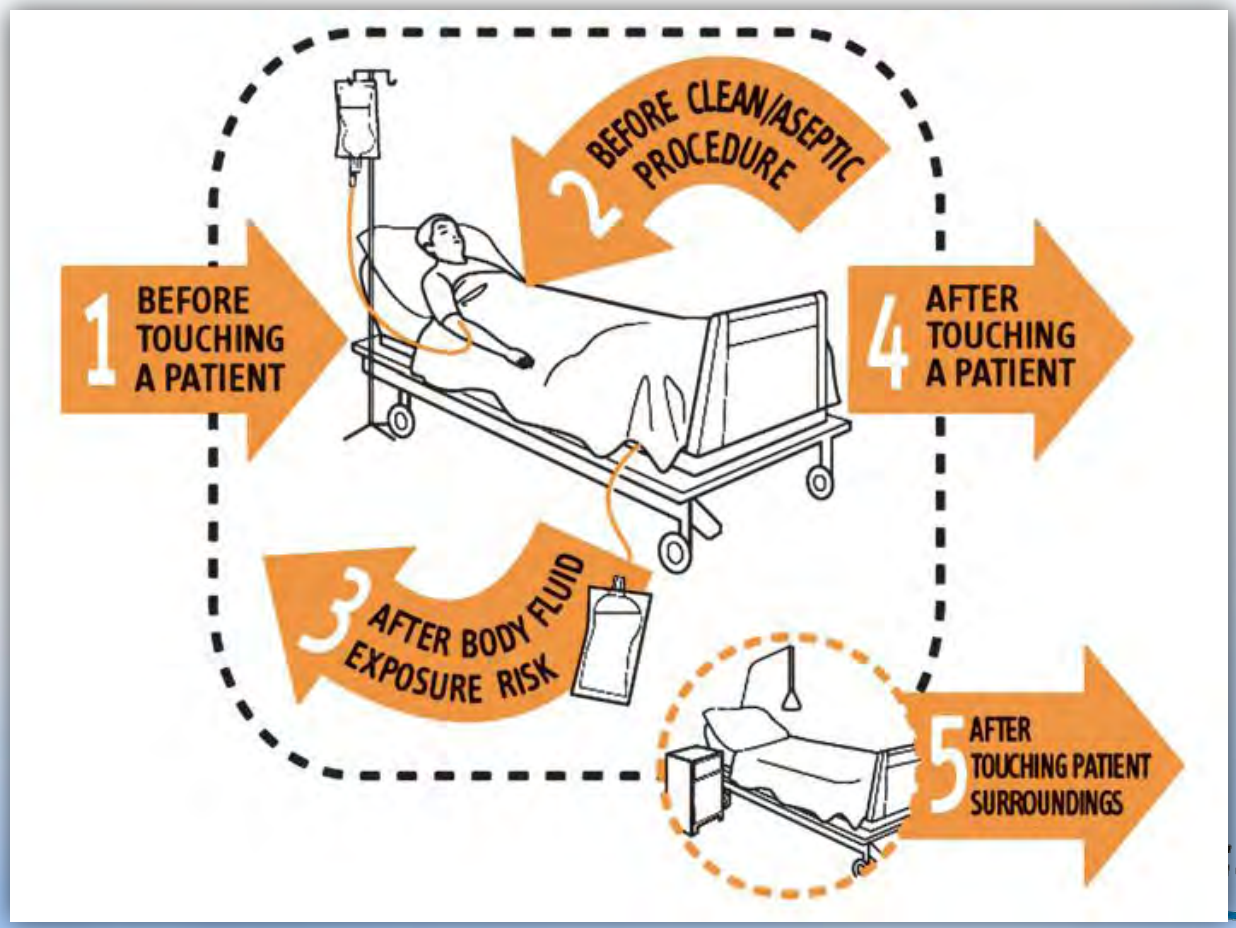
Prof Rotter et al. Vienna, Austria, developed DGHM-method 11, widely used standards in Germany and German speaking countries, developed in 1970s Also played key role in the development and introduction of the in vivo test method EN 1500

Prof Didier Pittet – HUG, Switzerland, use of alcohol based hand rub in infection prevention, WHO Hand Hygiene Guideline, **the 5-Moments of Hand Hygiene**, multi-modal / multidisciplinary approach, impact of human factors, partnership, multimedia, new technology

Prof John Boyce - Infectious Diseases CDC Hand Hygiene Guideline for Healthcare Sand Hospital Epidemiologist , Hospital of Saint Raphael in New Haven, CT, USA, Co-authored 2002 settings. Consultant to the WHO

My 5 Moments for Hand Hygiene

"For optimal compliance with hand hygiene , hand rubs should be readily available, either through dispensers close to the point of care or in small bottles for on-person carriage."



Some Important Indices in Infection Transmission and Prevention

- ..... 80% of diseases could be prevented through good hygiene practices and particularly hand hygiene
- Human hands carry more disease pathogens than found on a restroom seat
- Good hand hygiene practice could reduce infection by between 50% - 75% in certain parts of the world
- Heath care workers could be as much at risk as the patients

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Where are we today? - Alcohol Based Hand Rub (ABHR) – recommended for healthcare workers and patients?

- WHO guidelines on hand hygiene in health care and leading practitioners of infection prevention and control recommend ABHR as the product of choice to improve practices and reduce or stop the spread of pathogenic microorganisms in patients and Health Care Workers (HCW)
- No resistance effects in pathogens from the use of ABHR
- Use of ABHR contribute to the fight against antibiotic resistance around the world
- There maybe circumstances where non-alcohol based products maybe preferred or recommended, must be carefully selected

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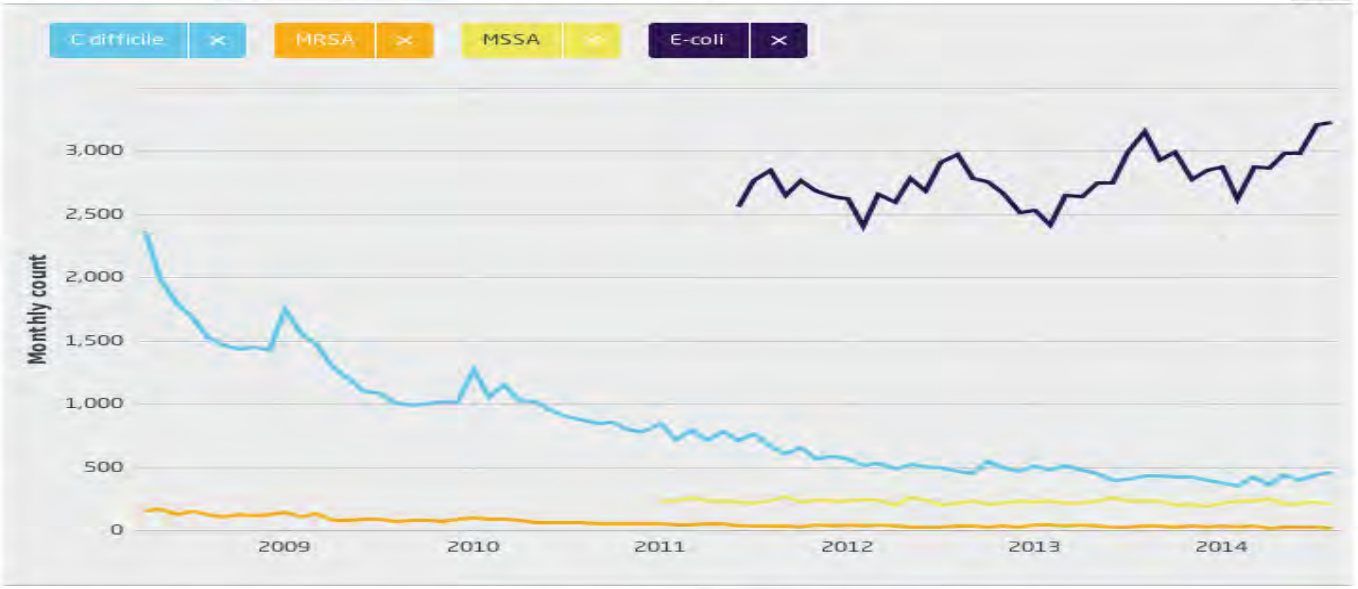
Trends in Health Care Acquire Infection - UK

Figure 23: Monthly counts of selected health care-acquired infections



Data source: Clostridium difficile infection: monthly data by NHS acute trust http://www.gov.uk.

Monthly counts of methicillin resistant Staphylococcus aureus (MRSA) bacteraemia by post infection review (PIR) assignment http://www.gov.uk.

Monthly counts of trust apportioned meticillin susceptible Staphylococcus aureus (MSSA) bacteraemia by NHS acute trust http://www.gov.uk

Monthly counts of Escherichia coli (E. coli) bacteraemia by NHS acute Trust http://www.gov.uk

Monthly MRSA bloodstream and *Clostridium difficile* cases

Progressively improved over the years

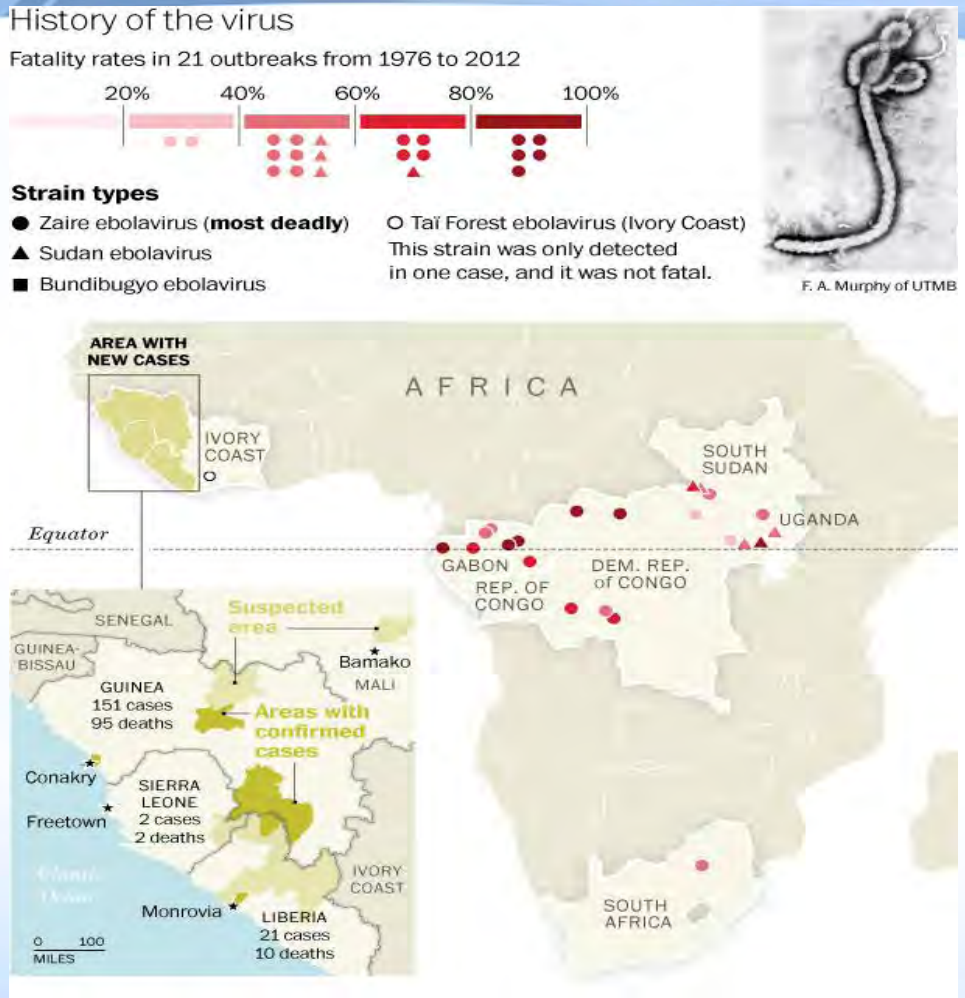
Some key driver: mortality rates, govt targets, cost and impact on society, legal actions

UK is focusing heavily on hand hygiene campaigns as part of the solution

Current IPC Challenges: Ebola virus pandemic

13 703 EVD cases, with 4 920 deaths, up to 27 October, 2014

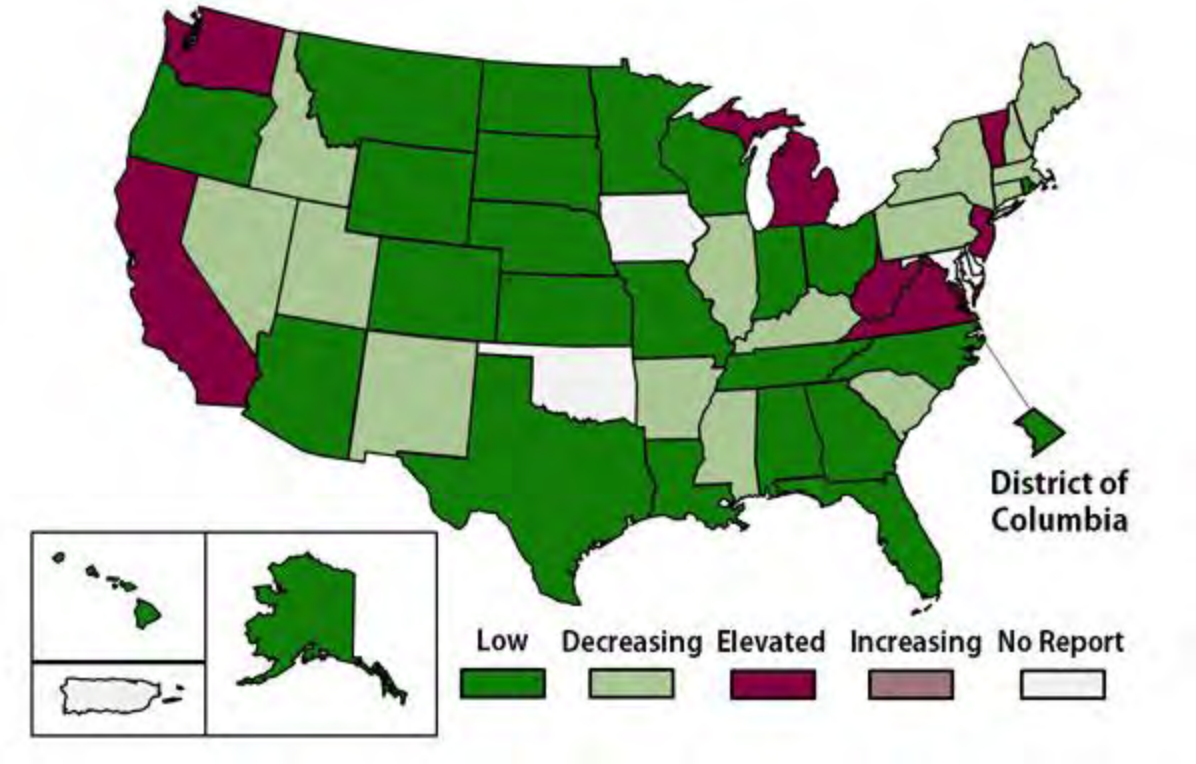
Frequent question: is ABHR effective against Ebola virus?



Source: USA CDC

Time is of the essences in all cases from identification to treatment

Current IPC Challenges: Enterovirus D 68



15 Oct 2014: 780 cases in 46 States confirmed in the USA by the CDC - including in the District of Columbia, (report may include similar viruses or viral symptoms)

Prevention include proper hand hygiene - good hand wash with soap

Avoid contact with patients

Product Selection in Hand Hygiene, what matters?

- Product format preferences – gel, foam or liquid, case of choice & suitability
- Holistic view of entire formation – concentrations / dosage, formulation technology, know-how, ingredients selection, test standards, efficacy, performance after repeated use, dispensing systems, etc.
- Claims – measurable and evidenced? Particularly efficacy (time, pathogens, dose) and skincare - feeling, duration, etc.
- Specific Ingredients – do they match the claims? Some environmental sustainability factors may apply,
- Value for money based on a total solution approach – formulation, dispensing systems, efficacy, skincare, support, training, etc.

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Product Format Considerations – is it a matter of choice?

Gel or Rub

Better skincare?
Longer protection?
Reduce skin irritation & dryness?
Takes longer to dry?
Viscose, easy to rub / retain?
Easy to rub due to viscosity?

Liquid

Drying time?
Shorter protection period?
Easy coverage, no rubbing?
Drier skin effect?
Drip effect?

Foam

Relative new & growing
As much effective as any other format?
Easy application?
Good skincare?
Drying time?
Enough coverage?
Less drip?

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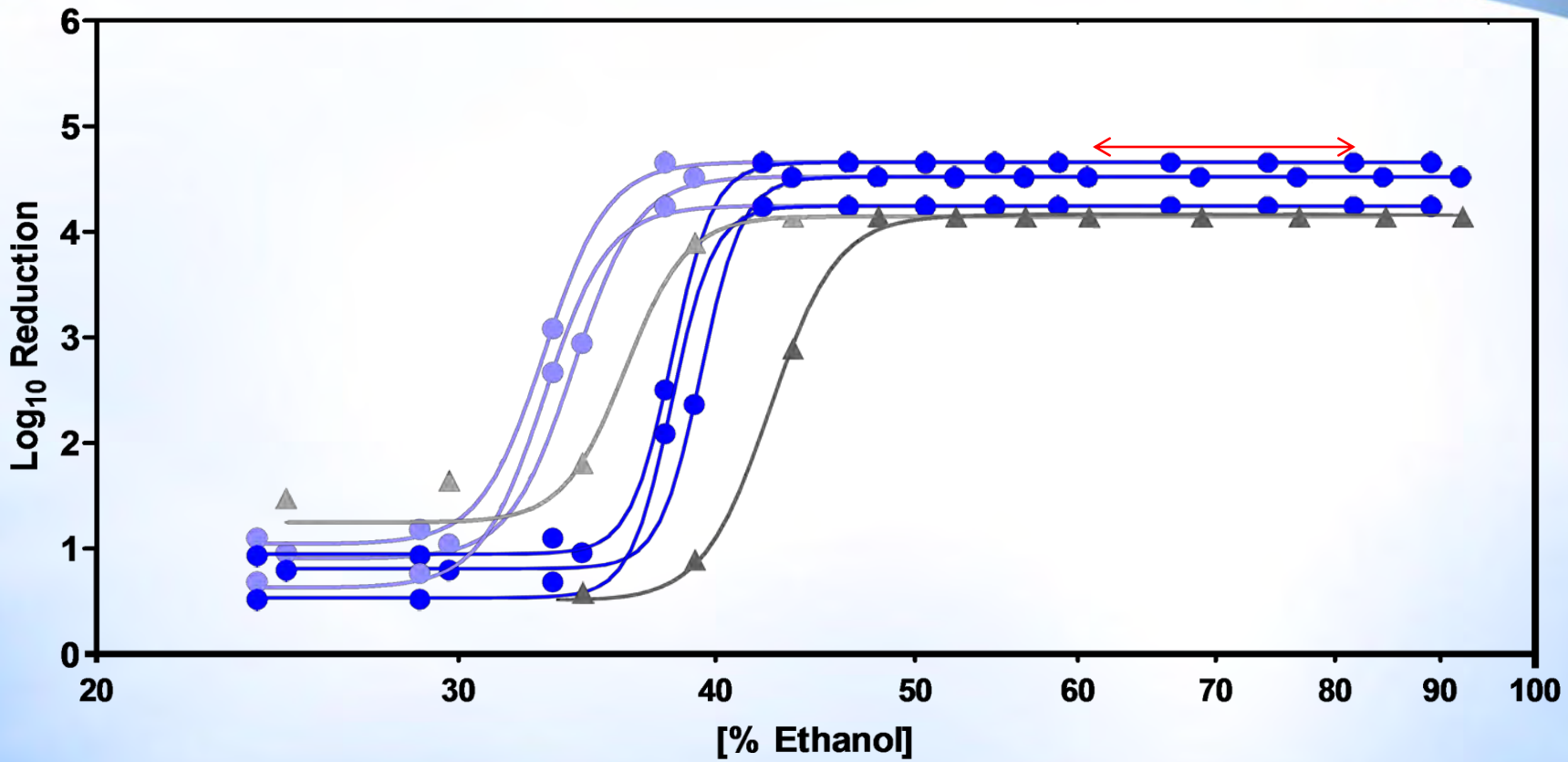
Product Formulation Matters



- S. marcescens
- S. marcescens (with 0.5% CG)

S. Marcescens (with 0.5% CG)
S. Marcescens

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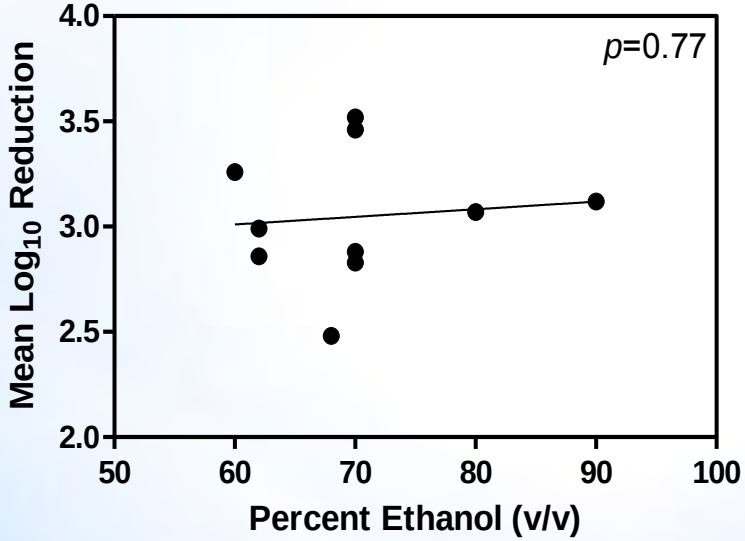
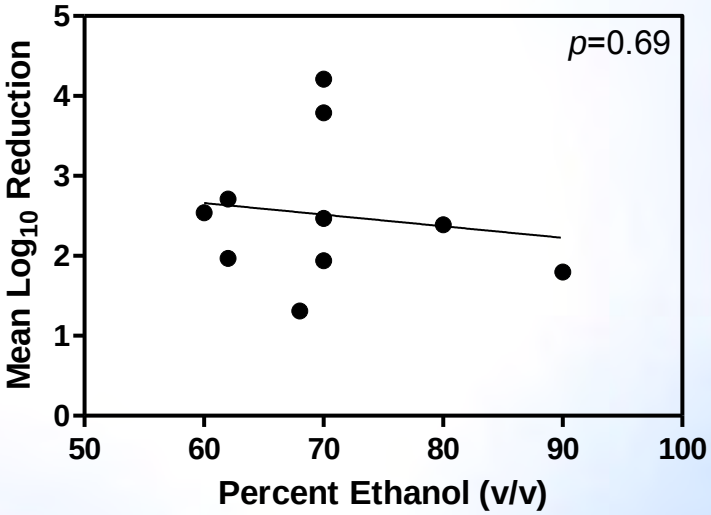
How Relevant is ABHR Concentrations?

HCPHW 2mL (ASTM E1174)

2.a. Comparison of Efficacy vs. Ethanol Level After a Single Use



2.b. Comparison of Efficacy vs. Ethanol Level After Ten Repeated Uses



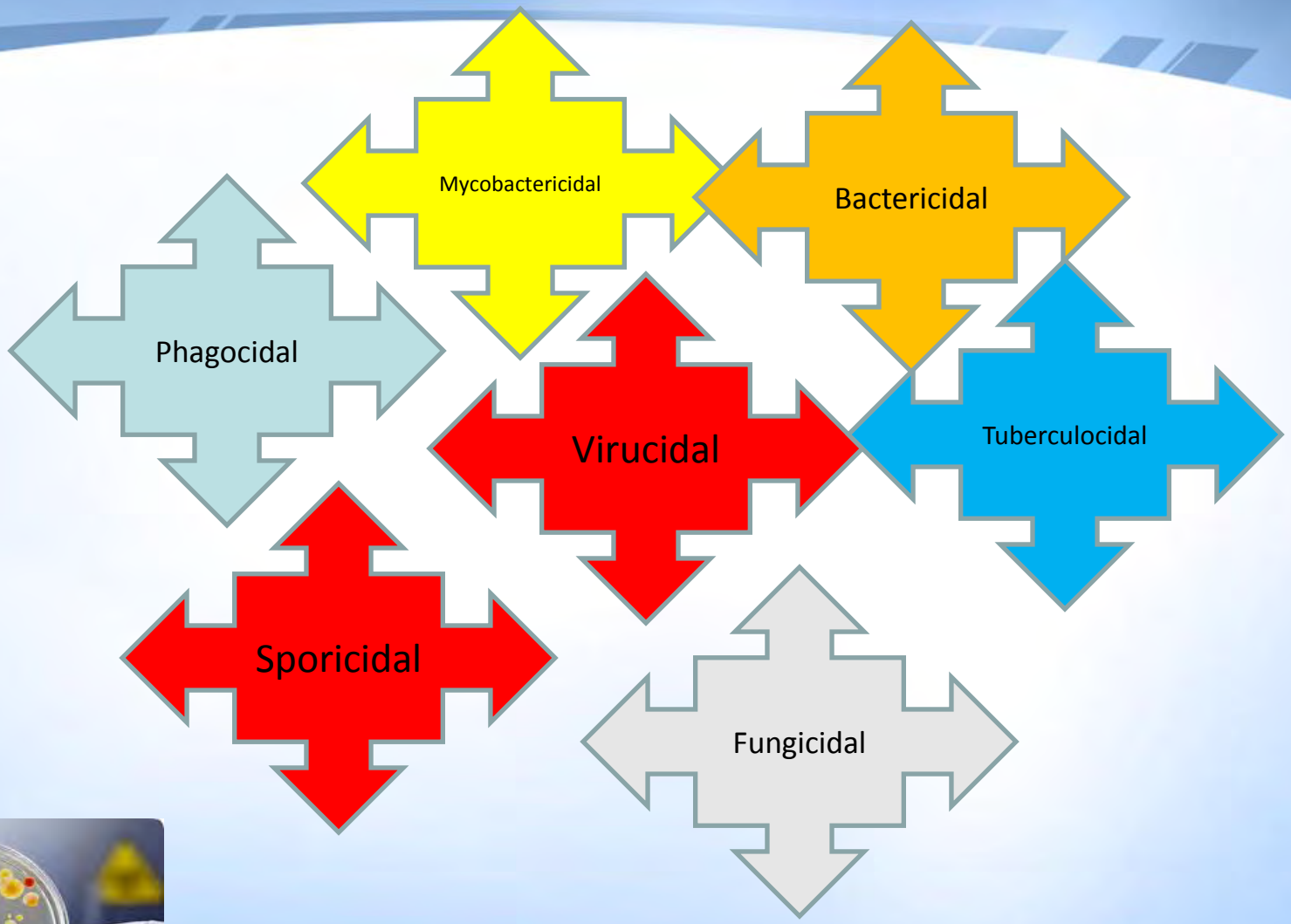
- **Alcohol concentration does not drive efficacy**
- **Efficacy was almost flat and starting reducing at high levels**
- **Formulation Matters**

Edmonds, S. E., *et al.* 2012. Comparative efficacy of commercially available alcohol-based hand rubs and World Health Organization-recommended hand rubs: Formulation matters . Amer. J. Infect. Control.

European Norm (EN) – preferred for Product Efficacy Assessment, Basic principles

- EN – sponsored by EU Commission and developed by various multi-disciplinary technical Committees and Working Groups of expert in the European Committee for Standardisation or Comité Européen de Normalisation (CEN)
- Member States Standards Organisations contribute experts
- Most tests are laboratory based, does not always simulate real life
- Specific terms and codes are used to describe each type of test and it is important to understand them to make informed decisions
- Test may differ significantly or slight between product categories
- They provide grounds for comparison between products and claims

Scope & Types of EN Test



Over view of Disinfectant & Antiseptic Tests: EN 14885: 2014 – final version to be published by CEN

- Covers all relevant tests
- Describes special conditions
- Useful for all professionals, provides quick overview,
  - **Phase 2 step 1 tests**
    - required tests
  - **Phase 2 step 2 tests**
    - used to simulate in-use condition, so called dirty conditions
    - required in most cases

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EN Test Categories

Phase 1	Phase 2 Step 1	Phase 2 Step 2
Quantitative suspension tests Phase 1	Quantitative suspension tests	Quantitative laboratory tests
To show active substances or products under development have bactericidal, fungicidal or sporicidal activity irrespective of use	For bactericidal, fungicidal, yeasticidal, mycobactericidal, tuberculocidal, sporicidal or virucidal activity	Demonstrates bactericidal, fungicidal, yeasticidal, mycobactericidal, tuberculocidal, sporicidal or virucidal activity
Phase 1 tests cannot be used for any product claim (on its own)	Under simulated (lab) practical conditions appropriate (close) to its intended use	When applied to a surface or skin under simulated practical conditions (e.g. surface, instrument, handwash and handrub tests)

EN: Hygienic Hand Disinfection – Hand rub

Pathogen	Test Required? Phase / step		Contact Time	Temp (oC)	Soiling	Lg reduction
Bacteria	2,1	EN 13727 / EN 1276	30 sec	20	Clean / dirty	5
Bacteria	2,2	EN 1500	30 sec / 60 sec	Skin T	none	> propan-2-ol
Yeast	2,1	EN 13624 / EN1650	30 sec	20	Clean / dirty	4
Mycobacteria	2,1	EN 14348	30 sec	20	Clean / dirty	4
Viruses	2,1	EN 14476	30 sec up to 5 min	20	Clean / dirty	4
Fungi	2,1	EN 13624 / EN1650	30 sec	20	Clean / dirty	4

Product for hand disinfection intended to be used without the addition of water
Wipe: phase 2/1, test with extracts from the wipe.
Phase 2/2 (EN1500) with wipe on volunteers hands according to intended use

required

EN: Hygienic Hand Disinfection – Hand wash

Pathogen	Test Required? Phase / step		Contact Time	Temp (oC)	Soiling	Lg reduction
Bacteria	2,1	EN 13727 / EN 1276	30 sec	20	dirty	5
Bacteria	2,2	EN 1499	30 sec / 60 sec	Skin T	none	> control
Yeast	2,1	EN 13624 / EN1650	30 sec	20	dirty	4
Mycobacteria	2,1	EN 14348	30 sec	20	dirty	4
Viruses	2,1	EN 14476	30 sec up to 5 min	20	dirty	4
Fungi	2,1	EN 13624 / EN1650	30 sec	20	dirty	4

Adapted to national transitional requirements

required

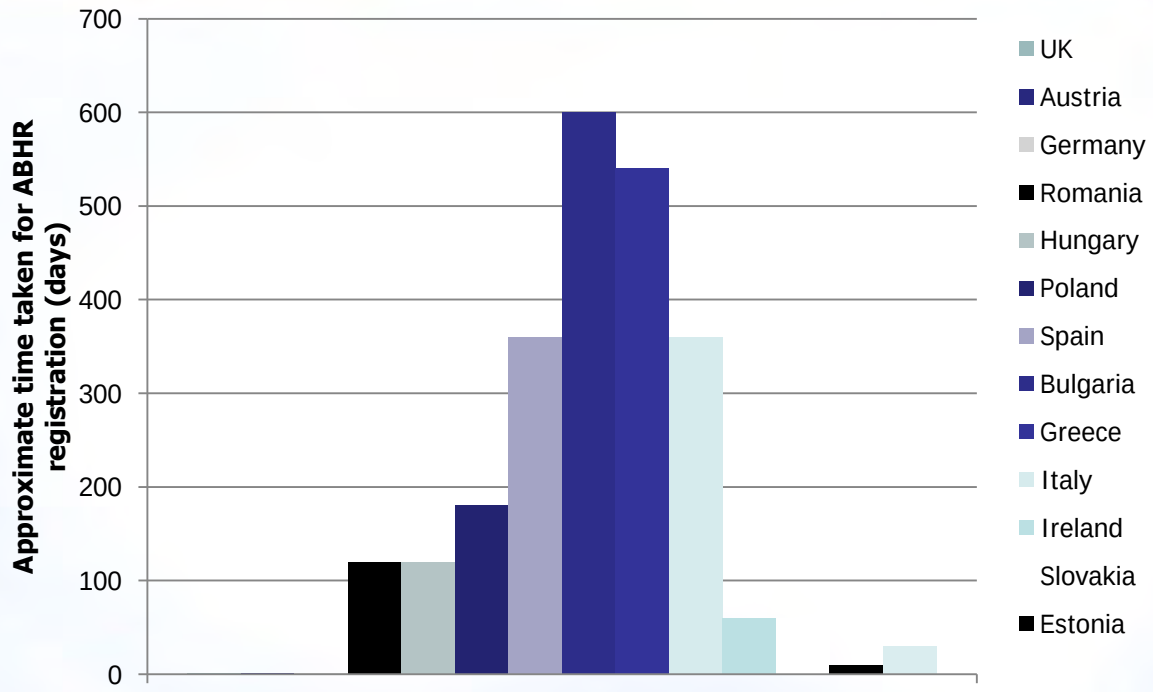
EN: Surgical Hand Disinfection

Pathogen	Test Required? Phase / step		Contact Time	Temp (oC)	Soiling	Lg reduction
Bacteria	2,1	EN 13727 / EN 1276	3 min	20	Clean / dirty	5
Bacteria	2,2	EN 12791	3 min	Skin T	none	> propan-2-ol
Yeast	2,1	EN 13624 / EN1650	3 min	20	Clean / dirty	4
Mycobacteria	2,1	EN 14348	3 min	20	Clean / dirty	4
Viruses	2,1	EN 14476	3 min	20	Clean / dirty	4
Fungi	2,1	EN 13624 / EN1650	3 min	20	Clean / dirty	4

Adapted to national transitional requirements

required

ABHR Registration Landscape in Europe



Note: apparent co-relation between regulatory pragmatism and the economy

Potential Impact:

- Availability of quality products
- Competition
- Local investment
- IPC initiatives by both internal and external partners

Future Regulatory Challenges & Potential Impact on IPC

- **Changing Regulation in the EU**
  - From Biocidal Products Directive (BPD) to Biocidal Product Regulation (BPR)
  - impact:
    - Harmonisation across countries
    - Cost?
    - Innovation?
    - competition ?
    - speed to market product & availability?
    - Uncertainties?
    - IPC?
  - ABHR – adverse classification
    - negative perception by end users?

What can we contribute as IPC Professions?

- In the fight against disease , to do nothing is not an option
- Are we promoting good hand hygiene ?
- How about innovative research and measurements?
- ABHR as an IPC product of choice? Contributing to reduction of antimicrobial resistance
- Are we educating and / or challenging actions around us?
- Are we discussing with authorities to influence outcomes?
- Are we working with or involving colleagues and other experts in a multi-modial and pluri-disciplinary approach?
- What motivates product selection? Is it sufficient evidence based?
- Some of these questions may help shape our next steps

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Summary & Conclusions

- Disease is on the move, are we matching it?
- The health of a people is their wellbeing and wealth
- The hand is key contributor to disease transmission
- ABHR is an important partner in the fight against diseases
- We all have roles to play in the fight, let's play together
- Have you found your part?
- Are you playing it, everyday
- and everywhere?
- Our policies and behaviour may affect the outcome

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Thank you

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Important Links

WHO - Guidelines on hand hygiene in health care

http://whqlibdoc.who.int/publications/2009/9789241597906_eng.pdf

WHO - SAVE LIVES: Clean Your Hand

http://www.who.int/gpsc/5may/background/en/

CDC – Guideline for hand hygiene in healthcare settings

http://www.cdc.gov/mmwr/PDF/rr/rr5116.pdf

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