



International Federation of Infection Control

# IFIC e-News

<http://www.theifc.org/>

## Chair Update



Judith Richards  
Chair, 2012  
IFIC Board

New year message from Dr J Richards, Chair

It is that time of the year where we look back and wonder at our successes and failures over the past 12 months.

I hope our readers will agree that this last year, in spite of the turmoils caused by natural disasters, wars and revolutions, and financial uncertainties, has seen another period of growth and consolidation for IFIC. Once again, with the support of our industry partners, and all our colleagues in the international field of infection prevention and control, we have held a very successful, interactive and scientifically stimulating Conference in Italy. We are grateful to all those who gave of their time and effort to come and join us for 3 very busy days, to those who lectured and ran seminars and workshops, and to the audience that participated in such a lively manner. We hope that the 2012 Conference, to be held in Zagreb in October, will be equally successful!

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## New IFIC Board Members

For the next 4 year term (beginning Jan 2012) there was one vacancy from each of regions A, B, D, F & G and nominations were received from all except Group D where a vacancy exists. An electronic ballot was held and the results are:

### Group A: Mrs. Anni Juhl-Jorgensen

Nominated by the Danish Society for Infection Control Nurses

Anni's interest in Infection Control and Prevention began in the nineties when she was Head Nurse at the Heart-lung and Vascular Surgery Department. In 2002 she was educated as an Infection Control Nurse at Copenhagen Nurse College, University of Copenhagen. Anni has specially focused on planning, education, and training of Infection Link Staff and is senior auditor of the Danish National Guidelines for Infection Control.

In 2003 Anni became a board member of the Danish Society for Infection Control Nurses (DSFH). She spent 3 years as vice Chair and has been Chair for 4 years.

Anni has been a member of the Nordic Association for Infection Control Nurses (NSFH) since 2004. She was involved in the planning of Nordic Hygiene Conferences in 2005, 2007 and 2011. Because she is now a board member of IFIC, one of her colleagues from the Danish board will take over her Nordic activities.

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**NEXT IFIC  
CONFERENCE –  
SEE PAGE 2**

## NEXT IFIC CONFERENCE



## Twelfth Congress of the International Federation of Infection Control (IFIC)

10-13 October 2012  
Zagreb, Croatia

## Chair Update continued (Continued from page 1)

This was the first year we instituted a new way of nominating and electing representatives to the Board of Trustees. Our new system now ensures we have scope for representation from all continents, and that high and low resource countries are equally represented. Of course our first attempt at electronic nominating and voting had a few glitches. We hope you are able to forgive the few minor problems, and that we can now move forward with a system we feel and hope will be more equitable and fair.

The Board of Trustees has also been busy discussing how to develop some practical ways of reaching different groups, and how to ensure we all network effectively. To this end, a number of projects and initiatives have been identified, and are now starting the process of being implemented.

They include (amongst others which are still under consideration):

- a project to assess how human waste (urine and faeces) is handled in health care settings;
- the development of an on-line, PowerPoint based, virtual course based on the recently launched new version of the Basic Concepts book;
- a review of international guidelines to assess gaps, duplications, and inconsistencies; starting with guidelines to prevent and control urinary tract infections in health care settings; and
- a new scholarship award, to facilitate short time visiting exchanges between colleagues from low and high resource settings.

These projects are all very new and just starting to take shape. We will keep our readers and colleagues informed, as we hope they will be of benefit to us all, and provide opportunities for further networking, and for supporting each other in our endeavours to reduce and prevent healthcare-associated infections.

Our web site continues to develop, and the new "Members only" area will be ready very soon. We hope this will be yet another incentive to join IFIC! Once again our thanks to our web master who continues to work behind the scenes to help with these developments.

This new year 2012 promises to be "not an easy one". Let us hope that it turns out to be better than currently predicted, and at least as good as the last one!

So, finally, my best wishes for a peaceful and healthy New Year to you all, in the hope that our wishes come true, and that working together we can achieve success.

Judith Richards, Chair  
2012 IFIC Board

## International Journal of Infection Control

Prof. Smilja Kalenic, from Croatia, is the Journal Editor. She is supported by Elizabeth Scicluna as Journal Administrator and an excellent Board of Assistant Editors (Ulrika Ransjö, Steve Barrett, and Bill Newsom).

Thank you to all those who submit their papers to IJIC and please keep them coming!

<http://www.ijic.info/>

## New IFIC Board Members (continued)

*(Continued from page 1)*

### **Group B: Teresa (Terrie) Lee**

Nominated by the Certification Board of Infection Control and Epidemiology, Inc. (CBIC)

Terrie is director of Infection Prevention and Employee Health at the Charleston Area Medical Center in Charleston, West Virginia, USA. She is a past president of both the Association for Professionals in Infection Control and Epidemiology and CBIC. She has more than thirty years experience in infection prevention and control, and her interests include surveillance of infections and organizational risk assessment, as well as education of infection prevention professionals.

### **Group G: Dr. Nagwa Khamis**

Nominated by the Society for Practitioners of Infection Control of Egypt (SPIC-EGYPT)

Nagwa is an Egyptian medical doctor, wife, and mother of three children in Cairo. She speaks Arabic, French and English languages.

She has worked as a professional in the field of health care infection prevention and control since 1989. Since 1997, she has been a consultant in infection control for six hospitals in Cairo. She has also been a consultant in clinical pathology (microbiology) and infection control at Ain Shams University Specialized hospital since 2008.

Nagwa received her training in five French hospitals, Pitie-Salpetriere, Saint-Louis, Bicetre, Georges Pompidou and Amien (from 1990 to 2008). She joined IFIC in 2001 and has been the chair of the Hand Hygiene SIG since 2007.

Her first publication was in 1999 (24 articles so far), mostly in Egyptian journals, and in the International Journal of Infection Control. She has prepared infection control manuals for 8 Egyptian hospitals and participated in the publication of two hand books: Hospital Guide for Disinfectants and Antiseptics (2010) and Antibiotic Usage in Hospitals (2011). Nagwa is the author of the chapter on Audits for Infection Control in IFIC Basic Concepts (2011) and Infection Control and Hand Hygiene modules of PSFH toolkit for EMRO (under publication).

Nagwa is a member of several Egyptian and international medical and infection control societies, and has been president of the SPIC-EGYPT (member society of IFIC) since 2008.

### **Group F: Patricia Ching Tai-Yin**

Nominated by the Hong Kong Infection Control Nurses Association

Patricia is a former President of the Hong Kong Infection Control Nurses' Association. She is a member of the Scientific Committee on Infection Control of the Centre for Health Protection of the Department of Health, The Government of Hong Kong Special Administrative Region.

The IFIC Board congratulates all the successful candidates and thanks all those candidates who allowed their names to stand and encourages continued support and interest in IFIC and the Board.

**SAVE THE DATES!**

Infection Prevention 2012

1 - 3 October  
ACC Liverpool



CHICA 2012  
Growing For The Future

16-21 June  
Saskatoon,  
Saskatchewan



For information go to [http://www.chica.org/conf\\_registration.php](http://www.chica.org/conf_registration.php)

APIC 39th Annual Educational  
Conference & International Meeting

4-6 June  
San Antonio, TX



For information go to [http://www.apic.org/Content/NavigationMenu/Education/APIC2012/APIC\\_2012.htm](http://www.apic.org/Content/NavigationMenu/Education/APIC2012/APIC_2012.htm)

Congress of the German Society for  
Hospital Hygiene

March 25-28, 2012  
Berlin, Russisches Haus



For information go to  
[www.krankenhaushygiene.de/2012](http://www.krankenhaushygiene.de/2012)

*We would like to acknowledge and thank our corporate Strategic Partners for their support and assistance in the fulfillment of our projects and initiatives*

The image displays a central logo for the International Federation of Infection Control (IFIC) with the text "INTERNATIONAL FEDERATION OF INFECTION CONTROL" and "STRATEGIC PARTNERS". Surrounding this central logo are several corporate logos: 3M Worldwide, ICNet, MEIKO, BD (with the tagline "Helping all people live healthy lives"), schülke, ETHICON (noted as "a Johnson & Johnson company"), and JANSSEN-CILAG. The logo for mintie corporation is also present at the bottom right.

## REPORT FROM CHAIR OF MEMBERSHIP SUB COMMITTEE

Full membership is offered to societies, associations, and organizations which provide or who are concerned with the provision of health care in premises anywhere in the world and which have a concern about infection control. IFIC member organizations should be governed by constitution in an approved form and have a local area of operation. Currently IFIC has a total membership of 81 infection control societies representing 63 countries. The current membership fee is UK £ 100 per year and is payable at each calendar year. If you are currently a member of the IFIC, and if there has been change of the officers of the organization, please notify Pamela Allan at [pallen@btinternet.com](mailto:pallen@btinternet.com) so that contact details are updated.

If your societies or organizations wish to join IFIC, please go to the IFIC web site and fill in an application form and send it to Pamela Allan at [pallen@btinternet.com](mailto:pallen@btinternet.com), IFIC Administrative Officer.

We welcome three new societies who joined IFIC in 2011:

- Scientific Forum on Home Hygiene, UK
- Sociedad Española de Medicina Preventiva, Salud Pública e Higiene, Spain
- Cyprus Nurses & Midwives Association (Infection Control Nurses branch)

Associate membership in IFIC was created in 2009. Associate members are defined as individuals professionally involved or interested in Infection Prevention and Control as well as non-commercial organizations which do not fulfil the criteria of full members. They are entitled to receive all published materials as well as any other benefits open to members. However they are not entitled to vote or hold office.

Currently IFIC has 553 Associate members in 82 countries. Current membership fee is UK £25 per year and is payable at each calendar year. However, IFIC recognises that individuals who live and work in low resource countries might be restricted from applying for membership because of limited financial resources. Therefore registration fees are waived for such applicants (see IFIC website at <http://www.theific.org/membersocieties.asp>). If you wish to become an associate member, please visit the IFIC web site and apply on line. Associate Membership is managed by Ms Simeona Zerafa, Associate Member Liaison Officer ([simeone.zerafa@gov.mt](mailto:simeone.zerafa@gov.mt)). All new members are approved by the chair of the membership sub committee.

Dr Nizam Damani  
Chair of Membership Sub-Committee

## NEW EDITION OF BASIC CONCEPTS

IFIC continues with its aim to provide up-to-date, scientifically sound tools and educational materials that can be used by professionals the world over. This new edition of IFIC Basic Concepts of Infection Control builds on its predecessors, enhancing and updating in a scientific way the knowledge required as a foundation on which local policies and procedures can be developed. Most chapters have been reviewed and brought up-to-date by an international panel of experts, and new ones have been added to ensure this new edition provides a sound comprehensive knowledge base. IFIC Basic Concepts of Infection Control is available at [http://www.theific.org/basic\\_concepts/index.htm](http://www.theific.org/basic_concepts/index.htm).

The publication and dissemination of this book was made possible through an unrestricted educational grant from BD. The International Federation of Infection Control is extremely grateful for their support.



## World Health Organization

### WHO free teleclasses

Teleclasses recordings from 2011 can still be accessed and a new very rich schedule for 2012 is available, courtesy of Webber Training. Teleclasses will be held monthly and will focus on emerging key topics in infection control, including the perspective of settings with limited resources. Take advantage of this excellent virtual training opportunity to keep up to date alongside colleagues from around the globe!

In order to participate, visit <http://webbertraining.com/schedulep1.php>.

#### **08/02/12, 2:30 pm (CET):**

Behavioural change in infection prevention and control (**A. Voss**, Nijmegen, Netherland)

#### **07/03/12, 2:30 pm (CET):**

Achievements in improving injection safety worldwide (**S. Khamassi**, Geneva, Switzerland)

#### **17/04/12, 12:30 pm (NYT):**

Implementing change: The technical & socio-adaptive aspects of preventing catheter-associated urinary tract infection (**S. Saint**, Ann Arbor, USA)

#### **07/05/12, 2:30 pm CET:**

**Special lecture for 5 May 2012** - Keeping the hand hygiene agenda alive: acting on data and the influence of global surveys (**D. Pittet**, Geneva, Switzerland)

#### **06/06/12, 2:30 pm (CET):**

Economic impact of healthcare-associated infection in low- and middle-income countries (**A.N. Yalcin**, Antalya, Turkey)

#### **11/07/12, 2:30 pm (CET):**

Patient empowerment in infection control (**C. Kilpatrick**, Glasgow, United Kingdom)

#### **08/08/12, 2:30 pm (CET):**

Processing medical devices in settings with limited resources: a neglected priority for infection prevention (**N. Damani**, Portadown, United Kingdom)

#### **05/09/12, 12:30 pm (NYT):**

Successes and challenges in developing and implementing bundles in infection prevention (**D. Goldmann**, Boston, USA)

#### **02/10/12, 2:30 pm (CET):**

The role of education in infection control in low- and middle-income countries (**S. Mehtar**, Cape Town, South Africa)

#### **7/11/12, 2:30 pm (CET):**

Measuring impact: key to infection control scaling up and sustainability (**J. Reilly**, Glasgow, United Kingdom)

#### **05/12/12, 1:30 pm (Sydney time):**

New developments in infection control for renal dialysis – an update (**W.H. Seto**, Hong Kong, China)

## 8th International Healthcare Infection Society (HIS) Conference and Federation of Infection Societies (FIS) annual conference

The FIS/HIS Conference is a unique collaboration between all organisations who have an interest in infection in its broadest sense in the UK (FIS), combined with the biannual HIS International Conference. HIS is returning to Liverpool, one of Britain's most vibrant and cosmopolitan cities, after the very successful 2010 HIS International Conference. The 2012 event will again be located in the BT Convention Centre, a purpose built, state of the art facility situated in the heart of Liverpool along the historic, world heritage waterfront.

The HIS conference takes place every two years and is the major international conference focusing on infection control attracting leading world experts in healthcare associated infections as speakers and delegates. As well as attracting accreditation from both the ACCME and the Royal College of Pathologists, it will provide a unique opportunity for everyone involved to learn the latest developments in this rapidly expanding and changing field.

The meeting is driven by an excellent scientific programme covering topics such as infection prevention and control, epidemiology and surveillance, decontamination, new technologies, infectious diseases, laboratory microbiology and antimicrobial agents to name a few. There will also be an opportunity for delegates to exchange views and ideas about the latest developments in nosocomial and hospital acquired / healthcare associated infections - always such an important part of this meeting for all parties.



## SPICEGYPT activities, 2011



The year 2011 was a real revolution in all aspects. Activities started in March with a workshop titled: "CSSD in Health-care Settings". It was held on 28 March and attended by about sixty participants, mainly nurses working in CSSD.

From 2 - 5 June, two members attended the annual congress of FS2H which was held in Lyon as part of an agreement program between SPICEGYPT and SF2H.

From 12 - 15 October five board members and the president of SPICEGYPT attended the eleventh IFIC congress held in Venice. Participation included oral and poster presentations and the announcement of Dr Nagwa Khamis, president of the society, being elected to the IFIC board as a member for group "G".

Two important events occurred in November 2011:

- Launching of the publication, a hand book of: "Antibiotic Usage in Hospitals"
- A two day conference, 22 - 23 November, titled: "Infection Control in Critical Hospital Departments" in collaboration with SF2H and the Tunisian Society for Patient Safety and Infection Prevention. Attendance was nearly 400 participants and 15 companies exhibited.





## IFIC Special Interest Group (SIG) “Construction, Design and Renovation”

### Notes from the business meeting of the Venice 2011 October 13

A business meeting was held during the IFIC congress in Venice with about 20 participants. Notes were kept by Walter Popp, who also chaired both the business meeting and the workshop. The board report was presented. The SIG will require a new secretary as Ulrika Ransjö plans to retire from the SIG in 2012.

The new Recommendations for Prevention of Airborne Infection were presented and briefly discussed; this information formed the basis for a well attended workshop on October 14. The workshop consisted of a short lecture by Shaheen Mehtar who is the author of the recommendations, followed by three cases concerning the design of an airborne isolation room in low, medium, and high income settings. Several new ideas were brought forward and will be considered for incorporation in the recommendations. Important points were:

- changing the title of the ‘Ideal’ column, to clarify that this concerns only some high-income countries
- the problems and lack of documentation regarding ultra-violet light

After editing and approval by the IFIC board, the document will be published on the IFIC website.

Remaining topics for recommendations are:

- Water supply, bathrooms, showers in hospitals (Silvio Brusaferrero)
- Endoscopy units (Lena Nilsson and Tina Bradley), draft will be available by May 2012.

Several new proposals were made for future topics:

- Construction needs for non-professional caregivers (Shaheen Mehtar). This may call for a revision of the Recommendations for Design of a Ward.
- Sterilisation unit (Walter Popp)
- Maternity and delivery rooms (Mary Caitlin, who joined the SIG and is chairing the Safe Childbirth SIG, promised to find someone responsible)

The members of the SIG are encouraged to make additional proposals or participate in one of the topics above.


Walter Popp will attempt to establish some internet discussion forum regarding questions or solutions of construction problems that the group members may have within their health care facility. The need for this forum has become apparent during e-mail correspondence between group members.

### IFIC Construction, Design and Renovation Interest Group Board Report September 15, 2011

During 2011, the SIG has had the following activities:

- ⇒ A paper on Design of Intensive Care Units has been completed and placed on the IFIC website.
- ⇒ A chapter on Hospital Design, Construction and Renovation has been written for the new edition of IFIC Basic concepts.
- ⇒ A paper on Ventilation to Prevent Airborne Transmission of Infection in a Healthcare Facility is in progress. The third draft of the paper, by Shaheen Mehtar, has been circulated to the SIG members and will be discussed during a workshop at the IFIC convention in Venice, October 2011 with participation by Walter Popp and Ulrika Ransjö.
- ⇒ Projects still remaining in the planning and development stages:
  - Water supply, bathrooms, showers in hospitals (Silvio Brusaferrero)
  - Endoscopy units (Lena Nilsson)

Walter Popp and Ulrika Ransjö

	Version 1—page 1	Date January 1, 2012
Author: Shaheen Mehtar	IFIC Construction, Design and Renovation Interest Group Ventilation to prevent airborne transmission of infection in a healthcare facility.	

## Introduction

The aim of this document is to provide practical, evidence based (where appropriate) written materials about construction, design and renovation in health care facilities, that can be used in the co-operation between Infection control personnel, building planners and engineers

SIG recommendations are given in three levels:

- **Basic** - Even with severely limited resources, this is what you should do as a minimum
- **Standard** – this is what you should aim for in most countries
- **Ideal** – if you have the resources, this is what you could do

This document outlines recommendations for appropriate ventilation applicable to all levels and types of healthcare facilities.

## Background

Transmission of pathogens in healthcare facilities is attributed mainly to hands of healthcare workers, but airborne transmission of pathogens has become more important with the occurrence of difficult-to-treat organisms especially *Mycobacterium tuberculosis*. The aim of ventilation is to dilute these microorganisms, including viruses, bacteria and fungal spores. Light and airy rooms also contribute to the general wellbeing of patients and staff.

For any type of air movement (ventilation) to happen, air has to enter and exit the area. Air supply is delivered by natural or mechanical means and removed with temperature gradients or by extract fans; ventilation could also be a mixture of both. Mechanical ventilation delivers a constant supply of air with appropriate number of air changes per hour (ACH). When the inflow of air is greater than the outflow, this is defined as positive pressure ventilation. When outflow exceeds inflow, the ventilation is defined as negative pressure in relation to the environment.

In countries with very cold climatic conditions, mechanical (controlled) ventilation is usually the norm, while in warmer climates, natural ventilation may be used. The cost of installing and maintaining air-handling units is high and often out of reach for some of the low or middle income countries. Separate ventilation is recommended for special units such as operating theatres, sterile services or isolation facilities. Large airflows require large vent sizes, fans and ducts. Clinical areas which require similar mechanical ventilation systems should be clustered if possible to reduce costs.


## Natural ventilation

The WHO has published guidelines on the optimal use of natural ventilation when designing new healthcare premises or upgrading existing structures. Natural ventilation is mainly achieved by temperature differences: air flows from warmer to cooler areas in the upper part of a door or window, and from cooler to warmer areas in the lower part. Tall buildings affect air movement by creating an upward or downward draft, depending on the prevailing winds or temperatures; as warm air moves upward and is replaced by cooler air. Openings such as windows, doors and verandas capture the entry of air, directing it into the building and out to the outside atmosphere. Advantages of natural ventilation are that it is inexpensive and can be applied to most areas except where controlled ventilation is required. The disadvantages are that the air supply and removal cannot be controlled, it is dependent on weather conditions and prevailing winds, and in cold climates the air might be too cold to leave windows open. Wind turbines ('Whirly birds') that can assist with air removal particularly from enclosed spaces are less expensive to install than fans, and require little maintenance.

## Mechanical ventilation

Air inflow is directed via an air handling unit, filtered and then channelled through the health care facility via ducts. Air in- and outflow is regulated by fans. Outflow air is extracted via ducts to the outside of the building, directly or via a filtered recycling system. Windows, doors and outlets must remain closed or sealed to ensure constant and appropriate air flows. Mechanical systems deliver constant balanced, negative pressure or positive pressure, ventilation as required. Balanced ventilation means that the amount of air which is delivered to, and extracted from, the room is of equal volume and allows for constant air changes in a given space. Air handling units which can be switched between negative and positive pressure should be avoided, as errors often occur. Mechanical ventilation is suited to high income countries, where extreme weather conditions exist and regular maintenance of the systems is an integral part of healthcare facility maintenance. The advantage is that the quality, temperature and humidity of air can be controlled with regulated air delivery and removal. The disadvantages are that it is costly to run, maintain and replace, it must be monitored regularly for optimum efficacy.

In high- technology facilities, ultra-violet germicidal light (UVG) has been considered a complement (NOT a substitute) to mechanical ventilation, but currently there is a lack of data to show that UVG prevents health-care associated infections. Practical and technical problems are common, and UVG is therefore not recommended except perhaps as an adjunct in ideal conditions.

	Version 1, page 2	Date January 1, 2012
Author: Shaheen Mehtar	IFIC Construction, Design and Renovation Interest Group Ventilation to prevent airborne transmission of infection in a healthcare facility.	

**Maintenance of mechanical ventilation**

Engineers maintaining mechanical ventilation should be trained in the following:

**Regular testing of air flow.** Air flow between rooms can be tested with smoke gas, usually titanium tetrachloride or a joss stick. Mechanical ventilation which is well designed and with fans running properly, the air flow at the inlet vents can be checked with warm-thread anemometers.


**Replacement of filters.** When the results show a reduction in air flow, the filters should be replaced. This is particularly true in dusty, dry and hot countries where the filters frequently get clogged. In cool countries, the filters are monitored and may be changed less frequently.

**Role of the IPC Team.** The IPC Team should be skilled in testing for airflow direction using available means. It is not an exact science but will give an idea of air movement. The recommendations range from titanium hydrochloride to joss sticks- the outcome is the same - document the direction of airflow.

Isolation facilities for airborne disease, particularly tuberculosis, should be tested for airflow prior to a patient being admitted. This is particularly important if the ventilation has been switched off or has not been in use for some time. Testing should be co-ordinated between the Engineering Department and the IPC Team. A written report with the findings and; if necessary, recommendation for remedial action should be sent to management and clinical teams.

**Application of ventilation systems in a healthcare facility**

Area	Basic	Standard	Ideal
General wards (see IFIC SIG Design of a ward)	Natural ventilation – open windows	Natural or mechanical ventilation	Mechanical ventilation; negative pressure in bathrooms and toilets
Intensive care	Natural ventilation	Natural or mechanical	Mechanical ventilation
Burns Unit.	Natural ventilation	Natural or mechanical ventilation	Mechanical balanced or negative pressure ventilation with temperature and humidity control
Neonatal unit	Natural ventilation with	Natural or mechanical	Mechanical balanced ventilation with tem-
Bone Marrow Transplant-during early periods of bone marrow suppression	Natural ventilation with clean, dust free air	Mechanical filtered positive pressure ventilation	Mechanical HEPA-filtered positive pressure ventilation
Endoscopy unit.	Natural ventilation.	Mechanical ventilation	Mechanical ventilation.
Bronchoscopy unit.	Natural ventilation. Well ventilated with open spaces.	Extraction with negative pressure ventilation.	Mechanical negative pressure ventilation. 6-12 air changes/h
Specialised TB hospitals.	Natural ventilation with large open windows.	Natural ventilation with extractor fans to provide negative pressure.	Mechanical negative pressure ventilation. . 6-12 air changes/h
Isolation rooms (with en-suite washroom). PPE according to transmission	Natural ventilation	Mechanical ventilation.	Mechanical balanced or negative pressure ventilation with 6-12 air changes/h
Isolation rooms for air-borne pathogens (with en-suite washroom). PPE must be worn	Natural ventilation with Extractor systems (fans or Whirly Birds) for improving negative pressure.	Mechanical balanced or negative pressure ventilation.	Mechanical balanced or negative pressure ventilation with 6-12 air changes/h. UV light as possible adjunct.

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**Application of ventilation systems in a healthcare facility**

Area	Basic	Standard	Ideal
Outpatients	Natural ventilation using open windows. Reduce population of overcrowded areas. Outdoor waiting areas if weather permits	Natural or mechanical ventilation.  Large and subdivided waiting rooms. Single waiting rooms for patients with long-standing cough.	Mechanical ventilation.  Large and subdivided waiting rooms. Single waiting rooms for patients with long-standing cough and other suspected infection.
Primary Health Clinics and community areas	Natural ventilation	Natural or mechanical ventilation	Mechanical ventilation
Sputum booths	Open enclosed area away from other patients	Natural ventilation and Whirly Birds (if enclosed space)	Mechanical negative pressure ventilation
Sterile services decontamination	Natural ventilation.	Extraction of air using extractor fans or Whirly Birds	Mechanical negative pressure ventilation
Sterile services: Inspection, Assembly and Packaging	Natural ventilation free of dust. No open windows.	Wall mounted air conditioners with filters.	Mechanical positive pressure ventilation.
Sterile storage	Natural ventilation	Mechanical ventilation	Mechanical ventilation
Mortuaries - In the post mortem room and over dissecting table	Natural ventilation with increased airflows. Whirly Birds or extractor fans	Mechanical ventilation. Air extraction away from mortuary table preferably mechanical	Mechanical negative pressure ventilation
Laboratories.	Natural ventilation free of dust. Bio safety cabinets	Natural or mechanical ventilation. Negative pressure in TB laboratory with bio safety cabinets	Mechanical ventilation with negative pressure in TB laboratory with bio safety cabinets
Main hospital kitchen	Natural ventilation	Natural or mechanical ventilation	Mechanical ventilation with temperature and humidity control
Milk preparation room	Natural ventilation	Natural or mechanical ventilation	Mechanical ventilation with temperature control
Pharmacy and Special fluid production Unit-		Natural or mechanical ventilation with filters. clean dry air. Safety cabinets for preparation of sterile fluids and medications.	Safety cabinets- positive pressure ventilation
Operating theatres <i>See IFIC SIG – Design of a surgery block</i>			