

# Nonwovens in medical industry



Ahlstrom Corporation

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# Agenda

1. Ahlstrom today
2. Medical nonwovens market
3. Ahlstrom solutions in medical nonwovens
4. Single-use vs. reusable medical fabrics
5. Nonwovens in the prevention of pandemics
6. Summary

# 1. Ahlstrom today

# Ahlstrom today

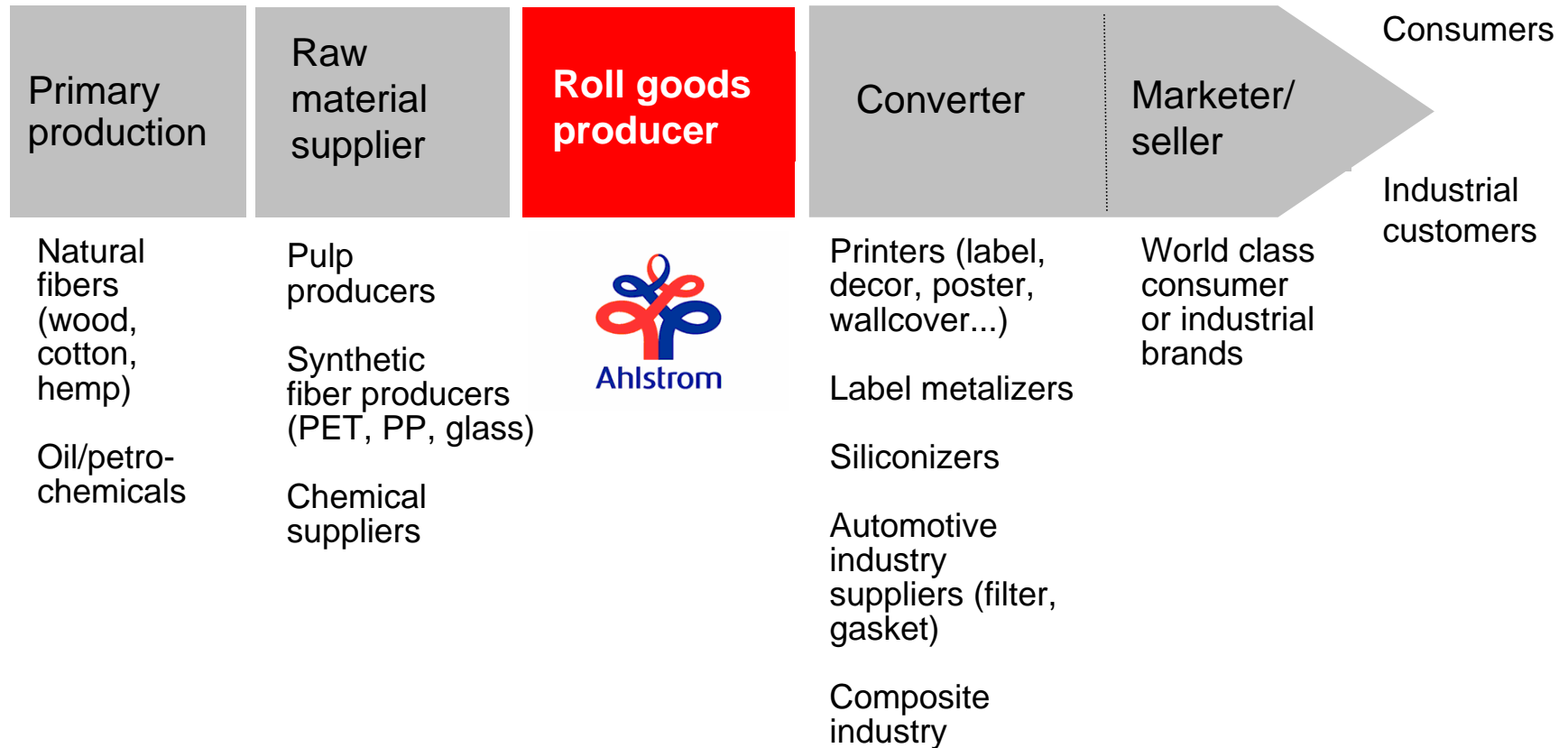
- Leading supplier of fiber-based materials
- 6,100 employees in over 20 countries on six continents
- Business segments
  - Fiber Composites
  - Specialty Papers
- Listed on the NASDAQ OMX Helsinki since 2006
  - IPO proceeds used for growth mainly in BRIC-countries (Brazil, Russia, India, China)
- Net sales EUR 1.8 billion in 2008
- Founded in 1851



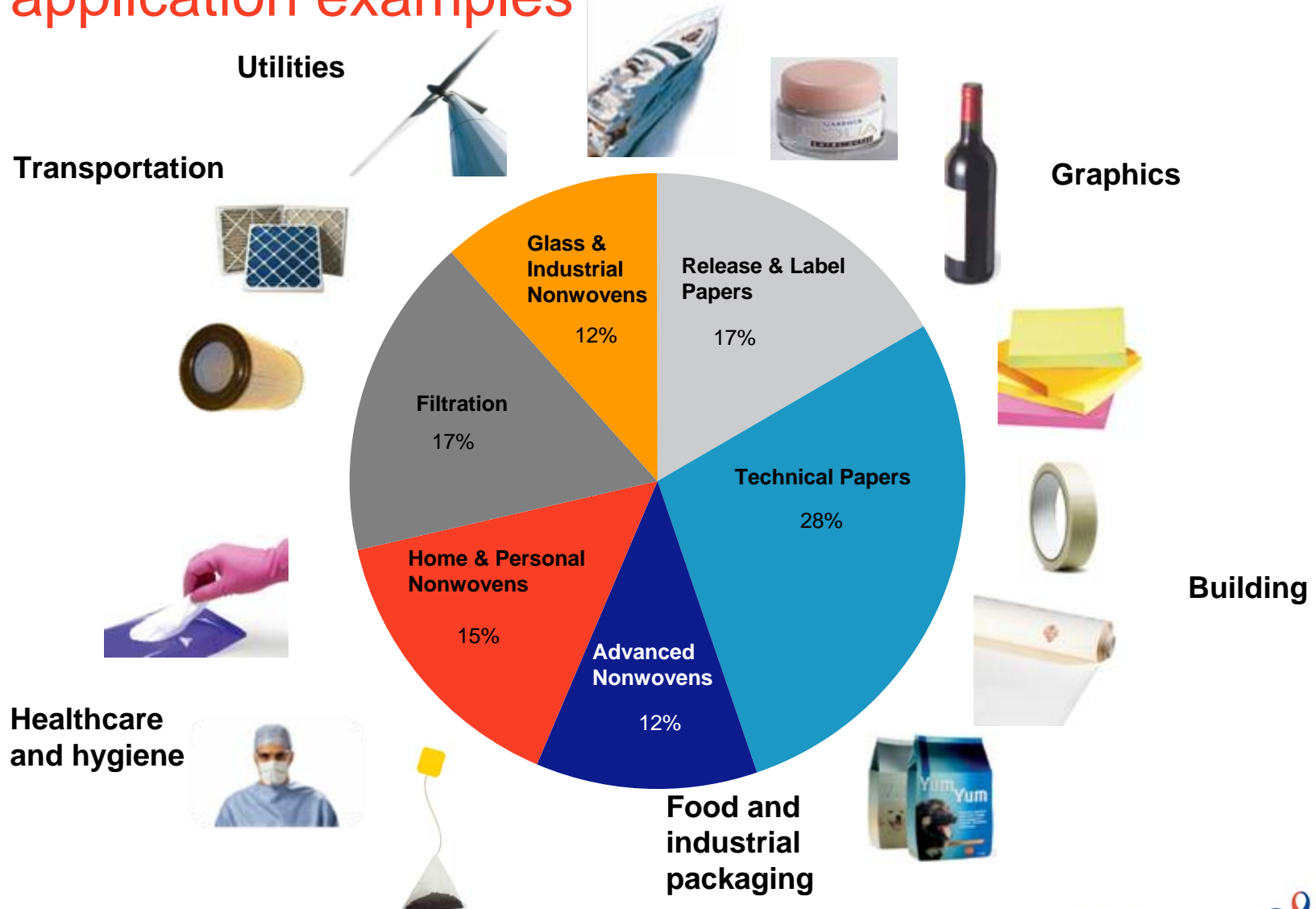
# Ahlstrom locations



# Ahlstrom in the value chain



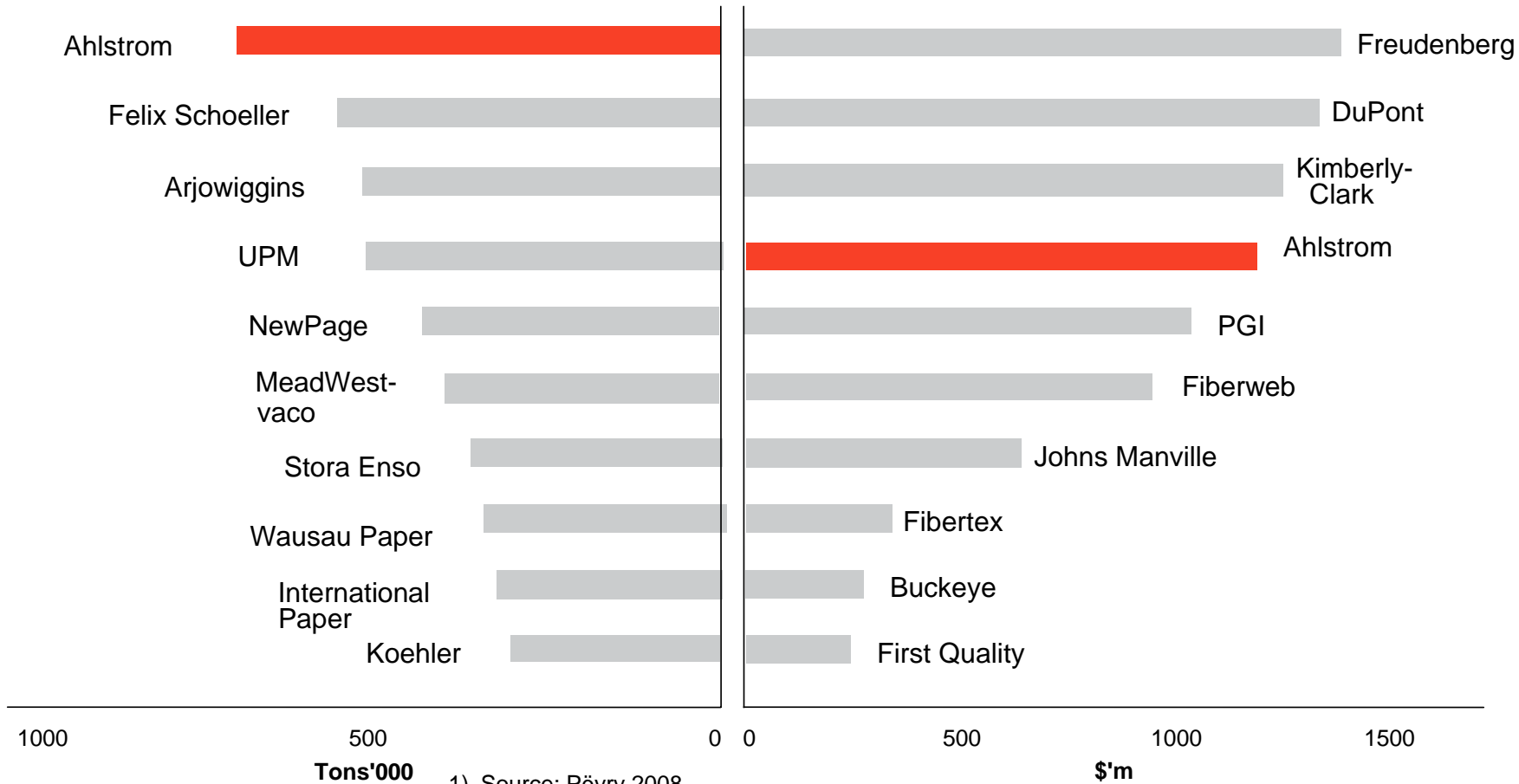
# Net sales by business area (Q1/2009) & end use application examples



# Leading supplier of fiber-based materials

Specialty papers market position (1)

Nonwovens market position (2)



1) Source: Pöyry 2008

2) Source: Nonwovens Industry, September 2008



# Leading position in most product lines

## Ahlstrom is the market leader or number two in:

- Transportation filtration
- Glass fiber tissue
- Pre-impregnated decor paper
- Nonwoven wipes
- Wallpaper and poster paper
- Crepe paper
- Food nonwovens food casings & infusion
- Genuine vegetable parchment
- Release base paper
- Medical nonwovens
- Abrasive paper
- Glass fiber specialty reinforcements
- Metalized label papers
- Post-it papers

## Key competitors

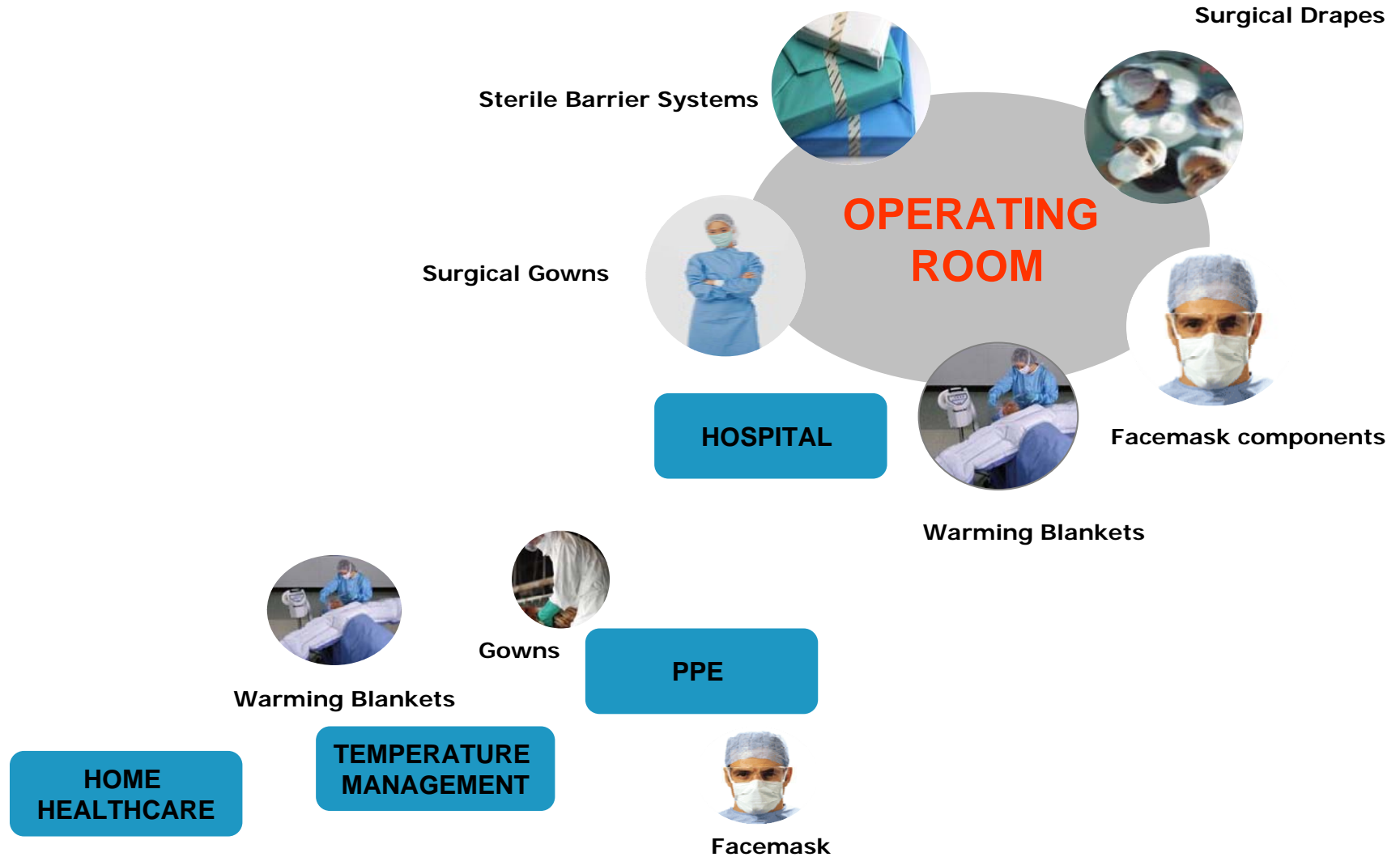
- **Filtration:** Andrew Industrial, H&V, Neenah
- **Glass Nonwovens:** Johns Manville, OCV, Saertex
- **Technical Papers:** ArjoWiggins, M-real, Neenah, Nordic Paper, SAPPI
- **Release & Label Papers:** Cham Paper Group, Delfort, New Page, UPM
- **Advanced Nonwovens:** PGI, Dupont, Kimberly-Clark
- **Home & Personal Nonwovens:** Jacob Holm, Kimberly-Clark, PGI

## 2. Medical nonwovens market

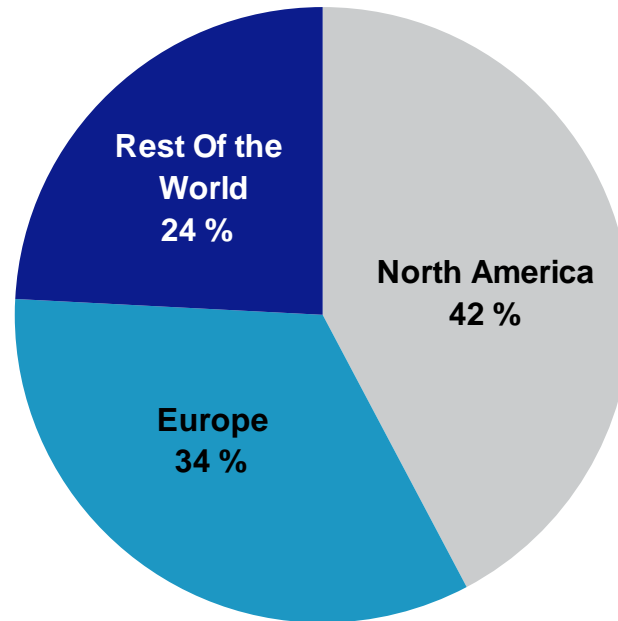
# What are medical nonwovens?

- Nonwovens are used in many medical and surgical applications:
  - Surgical drapes
  - Surgical garments such as gowns, caps, scrubs, aprons, and shoe covers
  - Sponges, swabs
  - Dressings and wound-contact pads of any kind
  - Face masks
- Nonwovens can be used outside the operating room as well in applications like home healthcare, temperature management and personnel protective equipment (PPE)

# Medical applications



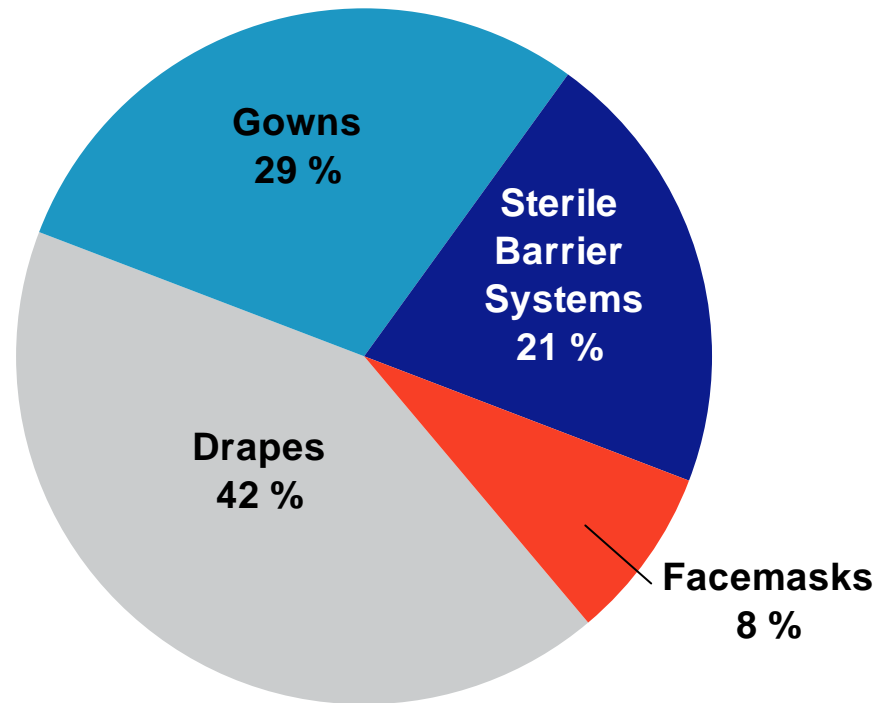
# The Medical Nonwovens market exceeds EUR 1.4 billion



**Medical nonwovens market size by geographical area 2008**

Source : Internal Ahlstrom Intelligence, INDA Report, 2008

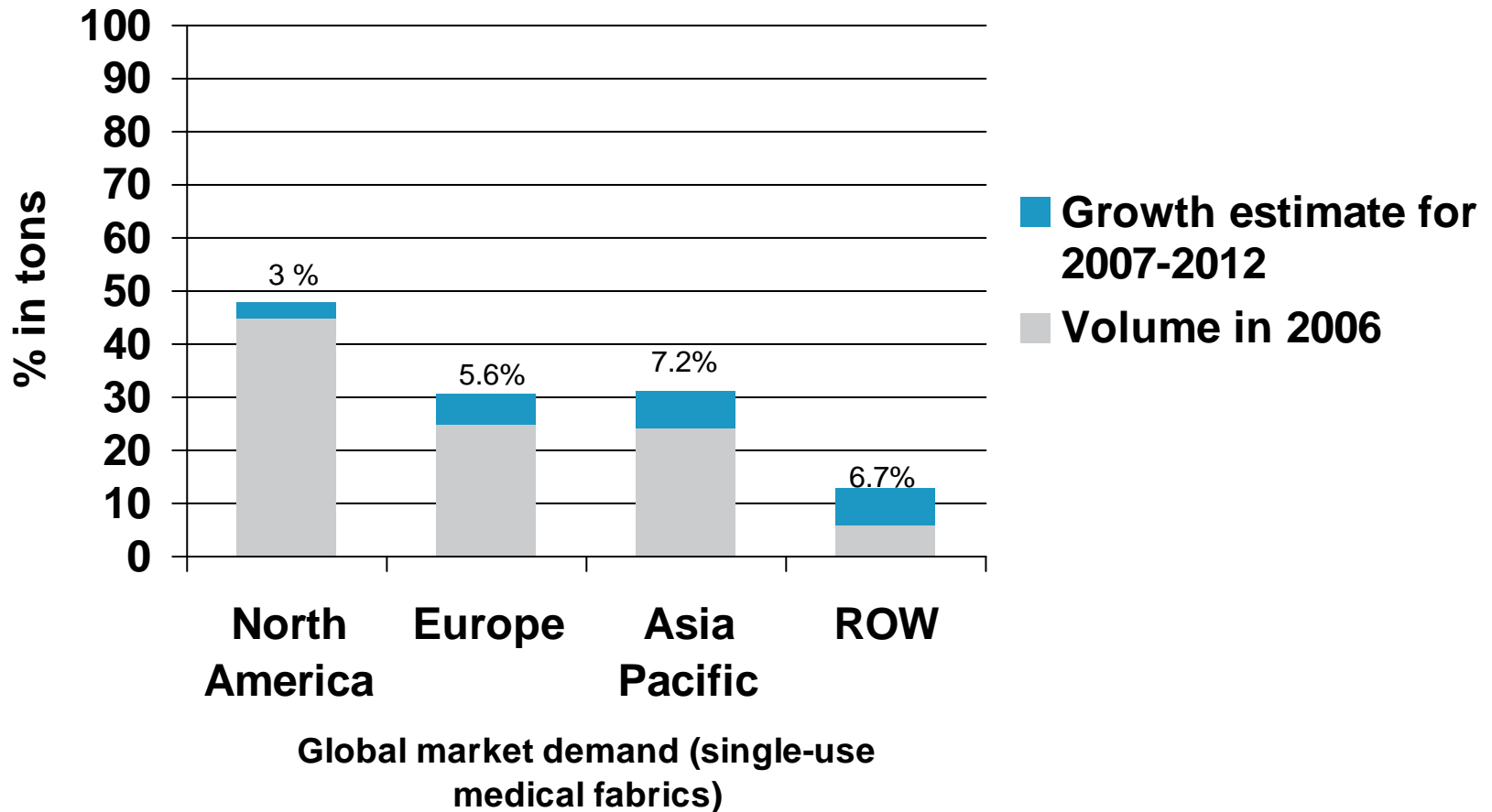
# Global Disposable Market split by product segment



**Product segments by volume (tons)**

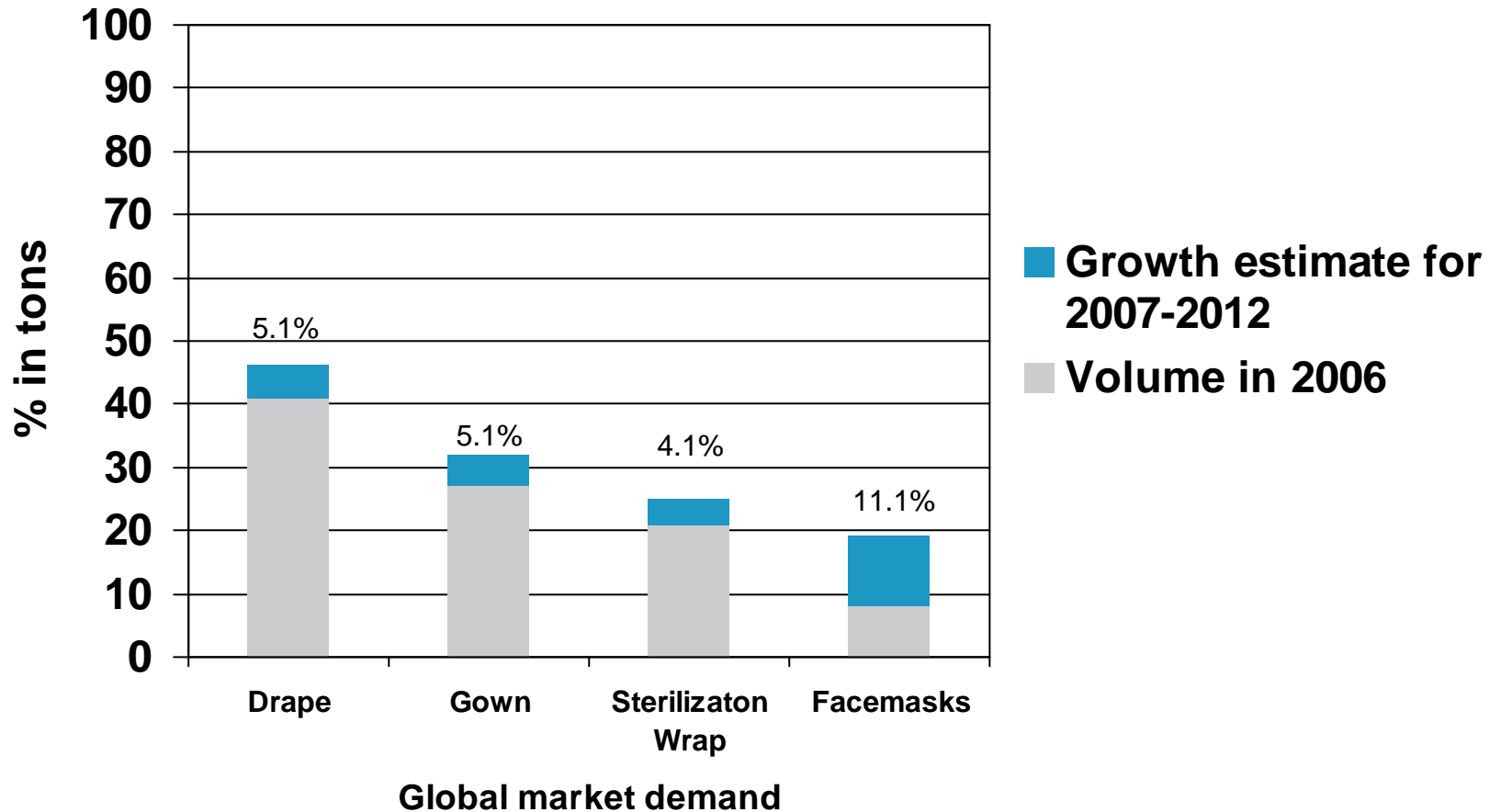
Source : Internal Ahlstrom Intelligence, INDA Report, 2008

# Global growth potential per region 2007-2012



Source: D. Rigby – Nonwovens End-Use products; INDA; World Demand and Supply Outlook for Spunbonded Polypropylene and Spunbonded/Melt Blown Composites, John R. Star, Inc. – June 2002; internal discussions; Freedonia 2006

# Global growth potential per product segment 2007-2012



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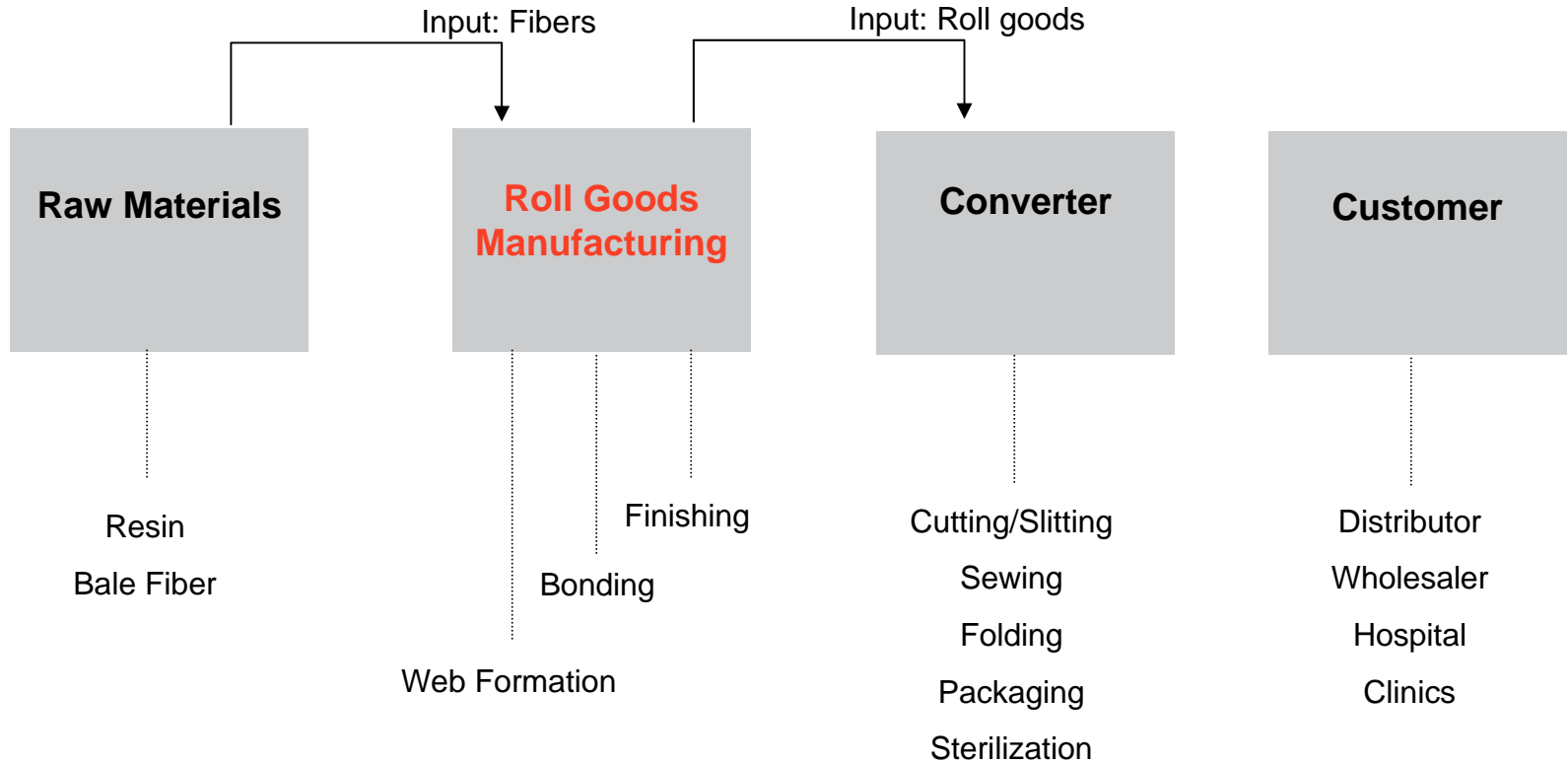
# Key growth drivers

- Rising standard of living in Asia Pacific
- Aging population worldwide
  - (APPENDIX: population pyramids in India, China, USA & Finland)
- Ongoing awareness of and concern over hospital acquired infections (HAI)

# Growth drivers by market area

- USA
  - Medical market is mature – growth is slowing due to saturated market
  - US Market is highly penetrated – thus little opportunity for growth
    - Surgical drapes: 90-95% of all major surgical procedures
    - Surgical gowns: 80% of all major surgical procedures
- Europe
  - Projected to experience high growth in medical nonwovens sector in the coming years
  - Local national standards being harmonized into European Standards (EN) – e.g. medical devices, protective equipment
- APAC
  - Rising standard of living, particularly in China, facilitates higher healthcare expenditures
- India
  - Traditional major disposable markets of absorbent hygiene, surgical apparel and patient drapes are underdeveloped, yet large potential markets
  - Indian market still very oriented to cotton (reusable textiles)
  - Healthcare industry growing at a rate of over 20%

# Medical nonwovens value chain



### 3. Ahlstrom solutions for medical nonwovens

# Advanced Nonwovens business area



Medical  
Fabrics



Food  
Nonwovens

# Medical fabrics

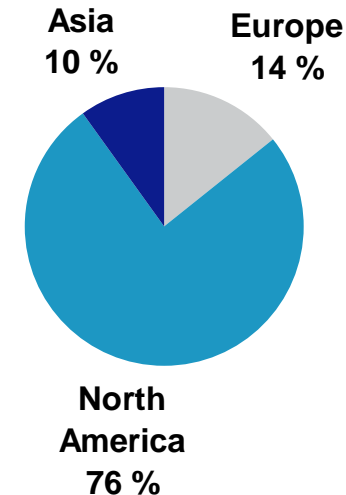
- Manufacturing in the USA, Europe and (starting in early 2010) India
- Material attributes provide infection control, sterility and guarantee patient, doctor and staff safety
- Ahlstrom provides single-use medical fabrics for operating rooms and other protective applications worldwide



# Market positioning

- Ahlstrom is 2<sup>nd</sup> largest supplier in medical nonwovens
- Leader in technology and innovation: 36 % of revenue comes from new products
- Major wet-laid supplier for medical applications
- Leader in facemask coverstock

- **Medical Sales**



- **5 Technology Platforms :**

- Spunlace
- Film based composites (BVB)
- Spunmelt (SMS)
- Spunlace Composite
- Wetlaid

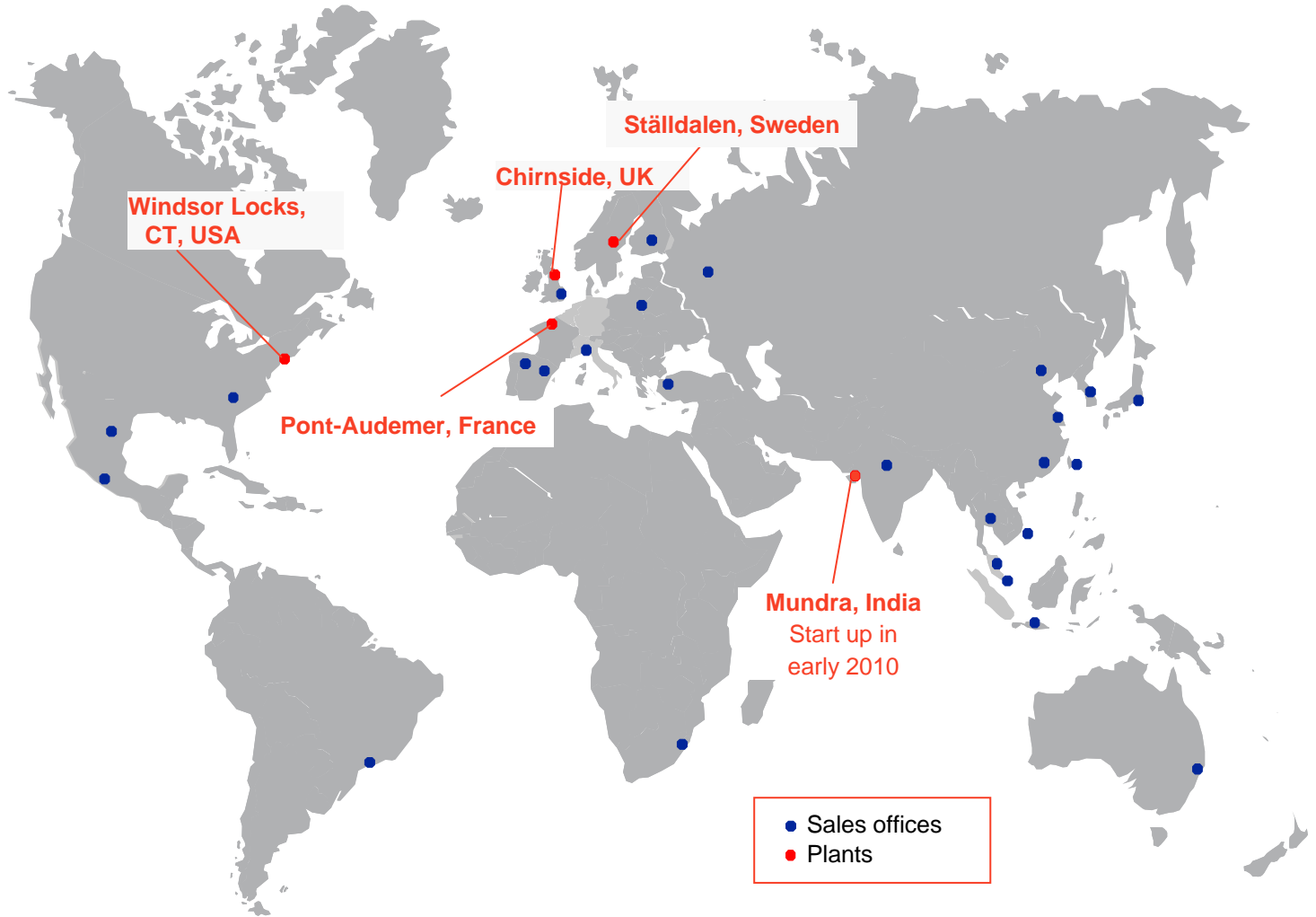
# Ahlstrom products for medical nonwovens

- Surgical drape
  - Back Table Cover
  - Drape sheet
- Surgical gown
  - Procedure/ Isolation gown
  - Scrub suit
- Facemask materials
  - Operating room
  - Dentist office
- Sterile barrier systems
  - Sterilization wrap
  - Tray liner





# Our manufacturing platform



# Pioneering into the medical market

- Ahlstrom entered the market through the Dexter Nonwovens acquisition in 2000 (EUR 275 million)
  - Sterilization wrap
  - Surgical drape and accessories
  - Facemask materials
- Ahlstrom then invested in new technologies
  - Nonwoven composites combined with specialty films - **2001**
  - Impacting the market in North America for surgical drapes and the globe for gowns (BVB - Breathable Viral Barrier) - **2002**
- Ahlstrom continues to invest
  - New plant starting up in India - **2010**

# Customer references

- Ahlstrom works with the major marketers in established markets:
  - Europe #1, #2 & #4
  - North America #1, #2 & #3
  - Japan #1 & #2
- Customer relationships are based on joint development and supply chain optimization
- Customers include e.g.
  - OneMed
  - Mölnlycke Health Care
- Ahlstrom is recognized for product innovation, quality, and after-sale service

# New medical fabrics plant in India

- After an investment of EUR 38 million, Ahlstrom will start a new spunmelt nonwoven plant in Mundra, in the western Indian state of Gujarat
- Mainly targeting the medical market, it will manufacture a full range of multi-layer spunmelt fabrics for applications in gowns, drapes and facemasks
- Strategically located close to suppliers and customers
- Consolidates Ahlstrom's position as one of the top-three global nonwoven suppliers
- Commercial production will start in early 2010



## 4. Single-use vs. reusable medical fabrics

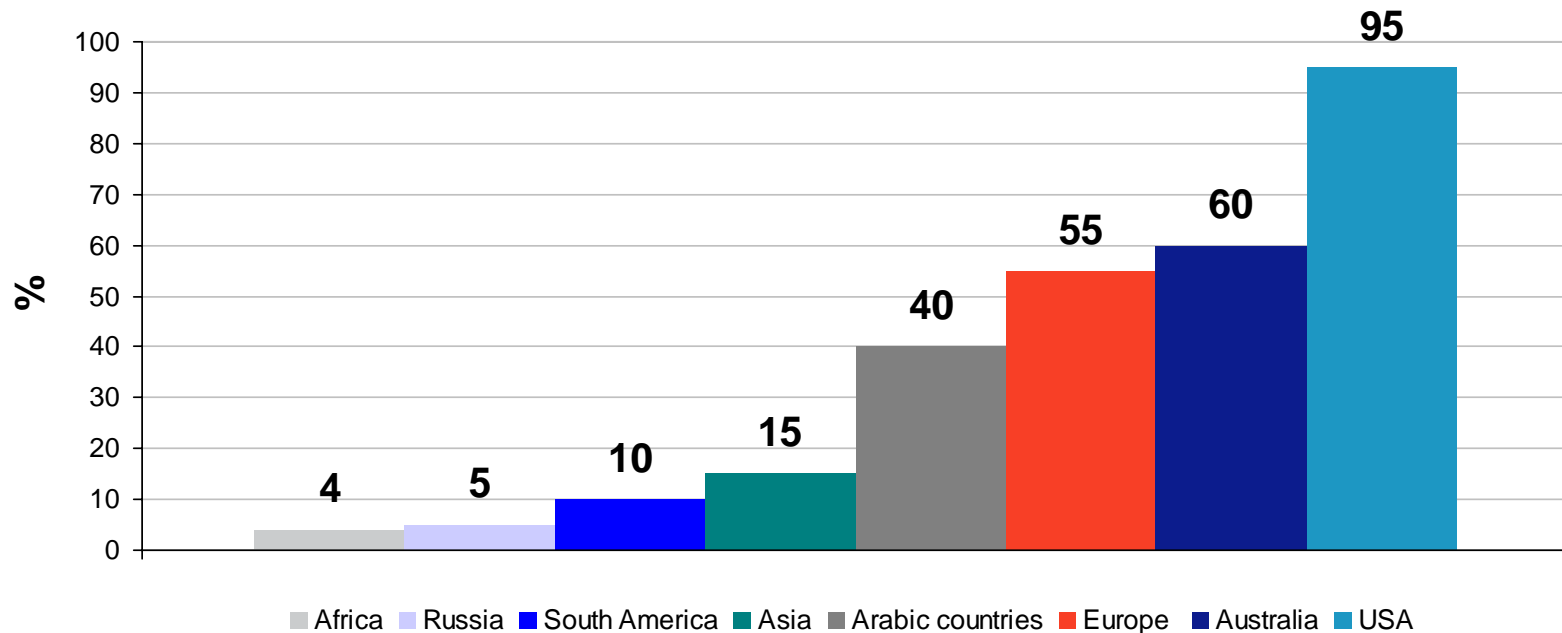
# Background

- In Europe up to 1970 - 1975 all hospital garments were reusable made with conventional textiles (cotton & cotton polyester)
- Conventional reusables have been linked to the increase of Hospital Acquired Infections (HAI) hospital infection
- In the early 1970's wetlaid single-use surgical drapes & gowns started to replace cotton & cotton polyester in the USA and later in Europe
- In the late 1980's the textile industry responded with introduction of new textiles (Goretex and Micro –fibres)
- Single-use fabrics have evolved over the last few years from paper to cloth-like (Spunlace, SMS, Triplex, Bicomponent)

# Background

- Developed countries have high single-use penetration, with growth expected in emerging countries (BRIC)

## Estimated single-use penetration in % vs. conventional textiles



Source: management estimate

Small fibers. Big difference.

# Trends

- Many hospitals are still treating wound infections rather than pro-actively avoiding infections
- Abuse of antibiotics has created resistance to treatment in hospitals
- Throughout the world new Viruses and Multi Resistant Bacteria (MRSA) are becoming a factor in HAI's (Hospital Acquired infection)
- Worst-case scenario: a Pandemic (Mutated H5N1 Avian Flu ~ H1N1 Swine Flu)
  - WHO just announced that Swine flu is a pandemic (June 11, 2009)
- Governments are reducing healthcare budgets
- Private insurance costs are increasing
- Need to reduce/eliminate hospital infections and mortality rates
- The aged population is increasing



# Regulations

SINGLE - USE	REUSABLE
<b>COMPLIANCE WITH GLOBAL STANDARDS</b>	
<b>YES</b> Completely fulfill global standards	<b>NO</b> Conventional textiles do not
<b>BARRIER PROTECTION</b>	
<b>YES</b> From blood-borne pathogens and cross contamination	<b>NO</b> Do not give any protection
<b>FLEXIBILITY IN USE</b>	
<b>YES</b> When incision needs to be enlarged/modified	<b>NO</b> Reduced flexibility
<b>CONSISTENCY IN USE</b>	
<b>YES</b> Always new and clean, consistent in performance	<b>NO</b> Textile can be compromised during laundering process (dirt, virus parts, blood...)

# Environmental impact

## SINGLE-USE

## REUSABLE

### ENVIRONMENTALLY "GREEN"

**YES**

Single use products are incinerated generating energy (2000T per day creating 200 million KWh yearly)

Single use drapes and gowns represent only 2% of hospital waste (hospital waste only 2% of municipal waste)

Synthetic fibers need **0** hectare agricultural area

Less than 1% of crude oil globally is actually consumed in production of man-made fibers

**VS.**

**NO**

High amount of detergent needed to launder and possible fluoro-carbonates (textiles need repeated impregnation)

Hospital or external laundries drain "contaminated wash water"

Cotton needs 1.3 hectare agricultural area/ton fiber

Cotton fields need lots of water (25000m<sup>3</sup>/ton) fertilizer pesticides, herbicides which destroy land by chemical pollution

### WAREHOUSE STORAGE

**NO**

Stock continually replenished

**VS.**

**YES**

Substantially more storage space – stock, prepared and used must be stored

# Cost comparison

## SINGLE - USE

## REUSABLE

### LOWER FIXED COSTS

**YES**

Fixed costs to hospitals

**VS.**

**NO**

Unexpected repair/replacement costs

### HIGHER VARIABLE COSTS

**NO**

**VS.**

**YES**

Sorting, segregation, sharp instruments damage, laundering, inspection, folding, packing

### LOWER OTHER COSTS

**YES**

Reduced costs to hospitals due to reduced HAI

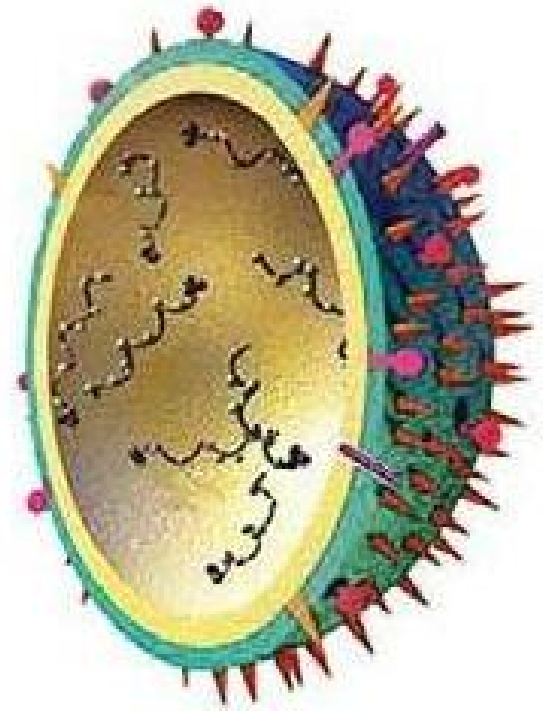
**VS.**

**NO**

## 5. Nonwovens in the prevention of pandemics

# The facts of influenza

- Influenza, also known as the flu, is caused by a virus
- Antibiotics will not cure influenza
- In the last century: three pandemics
  - Spanish Flu (1918-19), 40 million people died
  - Asian Flu (1957-58), estimate 1 million people died
  - Hong Kong Flu (1968-69), estimate 1 million people died



Influenza virus

# Pandemic influenza

1. Influenza pandemics are recurring events
2. All countries must be prepared
3. Existing medical supplies are not inadequate
4. Causes large number of deaths
5. Causes economic and social disruption
6. WHO will alert the world when a pandemic threat increases

# Preparation for pandemic influenza: prevention and protection

## PREVENTION

- **Education/awareness**
- **Animal extermination**
- **Travel restrictions, closure of borders**
- **Quarantine**
- **Vaccine inventory**

## PROTECTION

- **Proper hygiene techniques**
- **Source protection**
  - **Poultry workers**
  - **Healthcare providers**
- **Protective Apparel**
  - **Eye, face, glove, garment**

# Ahlstrom BVB applications

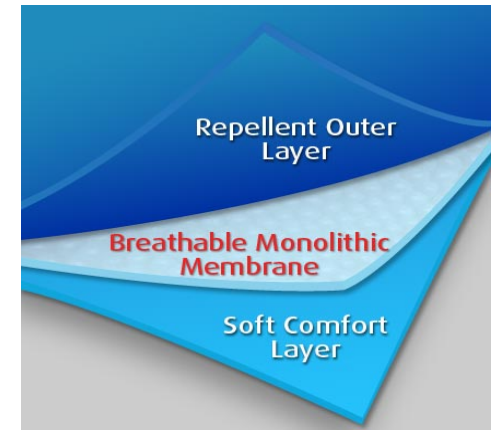
- BVB = Breathable Viral Barrier
- Surgical gowns
  - Reduce cross-contamination between medical staff and patient's body fluids
- PPE (Personal Protective Equipment) apparel :
  - Protection for pandemic Influenza





# BVB technology

- Construction
  - **Outer layer:** additional fluid repellency & strength
  - **Middle layer:** responsive, monolithic membrane for impervious barrier
  - **Comfort layer:** soft touch to the wearer's skin
- Protection against bacteria and viruses, as small as 0.027 micron (Avian flu/Swine flu: 3x larger=0.08-0.12 microns)



# BVB: Product benefits

- Barrier against viruses such as:
  - Hepatitis, HIV, AIDS, CJD
  - MRSA (bacteria)
  - SARS, Avian influenza, Swine influenza
- Liquid barrier
  - Reduces cross-contamination between medical staff and patient's body fluids
- In compliance with international standards
- Comfortable to use: light weight, breathable, cool



# Global standards compliance (2009)

## Europe

- **EN 13975**  
parts 1,2,3
- **MDD 93/42/EEC**
- **PPE 89/686/EEC**
- **Endorsed by**  
**AFPP/NATN**

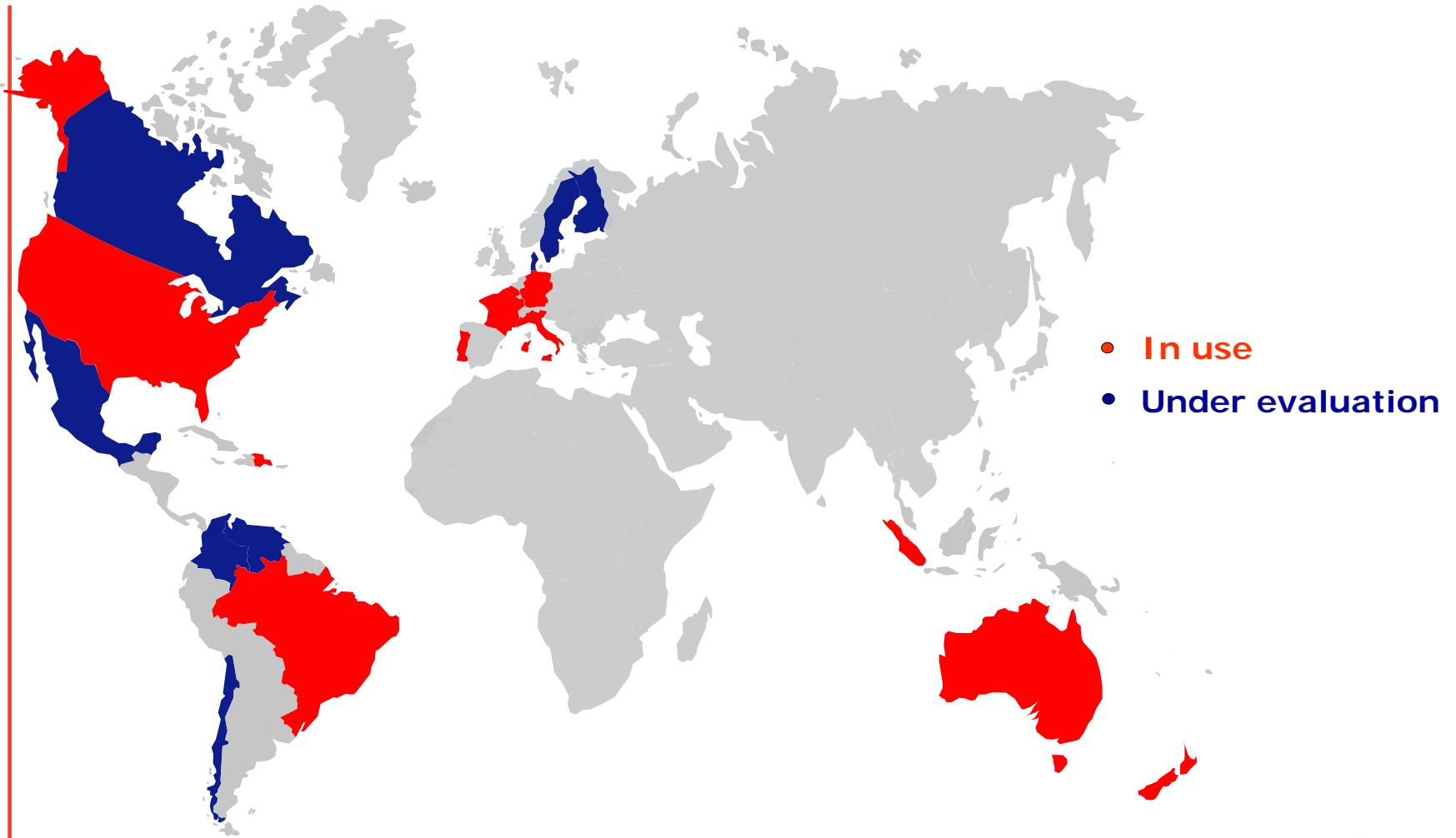
## North America

- **AAMI PB-70**
  - **Level 4**
- **ASTM**  
**F1670/1671**
- **OSHA**  
**Guidelines**

## Global

- **Recognized by**  
**Center for**  
**Disease Control**
- **Certified by China**  
**CDC**

# Where is Ahlstrom BVB used?



## 6. Summary

# Ahlstrom medical fabrics – summary

- More than 25 years of expertise in the medical market
- Growth through innovation
- Customized solutions based on a broad technology base
- Globally expanding manufacturing and service network

# The future of medical nonwovens

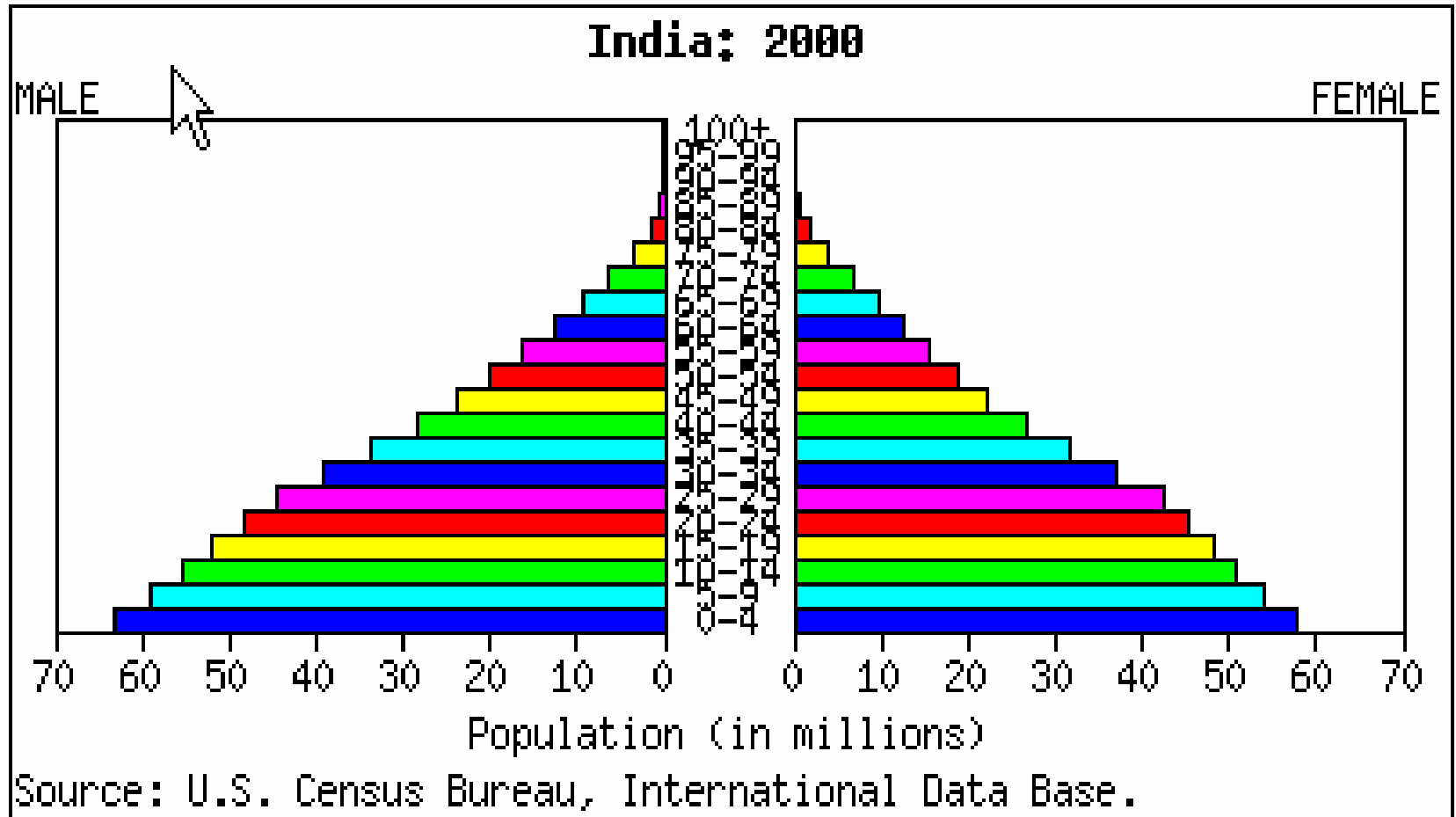
- Continued focus on infection prevention
- Driven by innovation and cost-effectiveness
- The effect on demand of emerging markets and an aging population
- Leveraging Ahlstrom's global reach

# APPENDIX

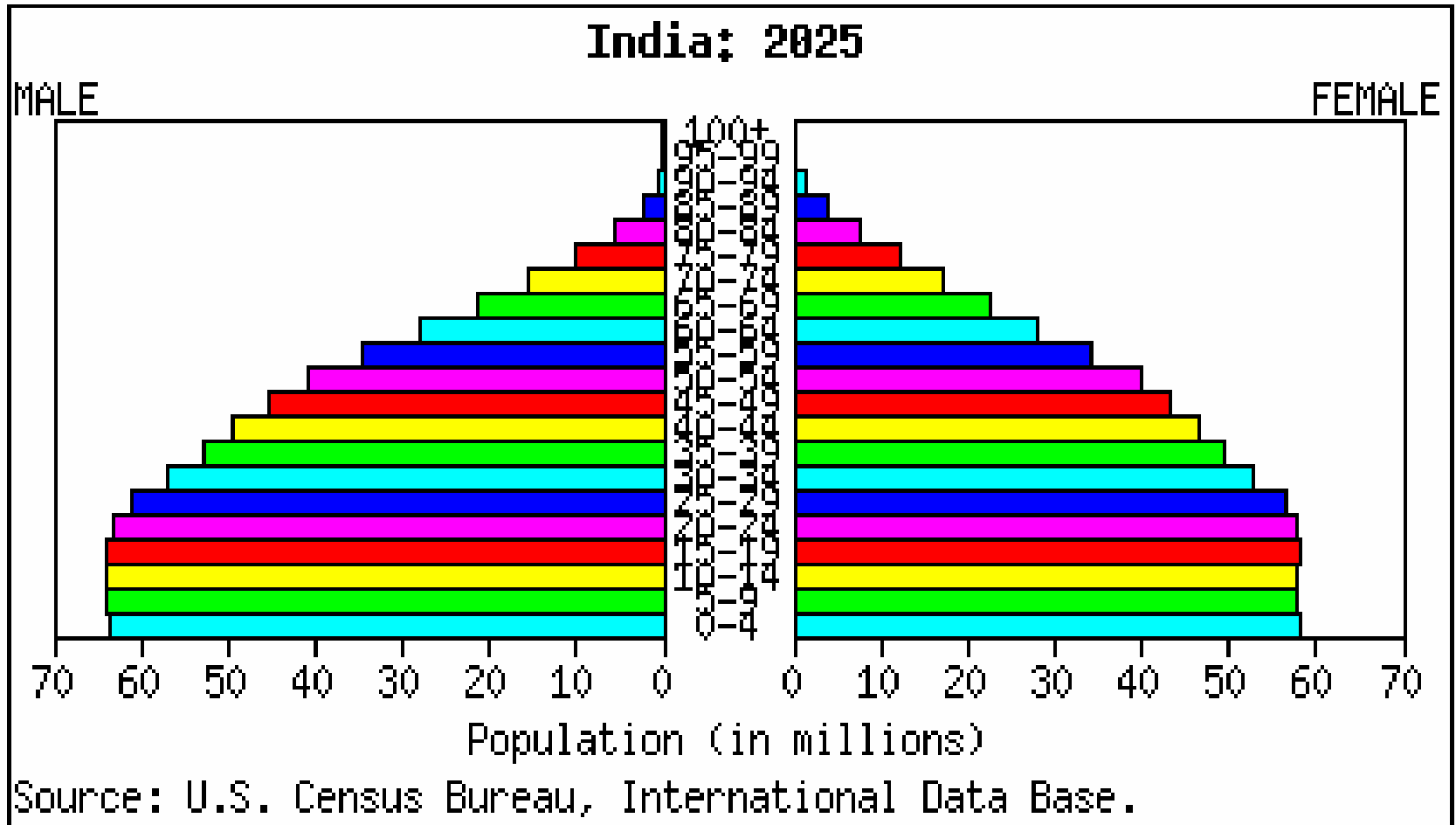
## Population pyramids in the years 2000 and 2025



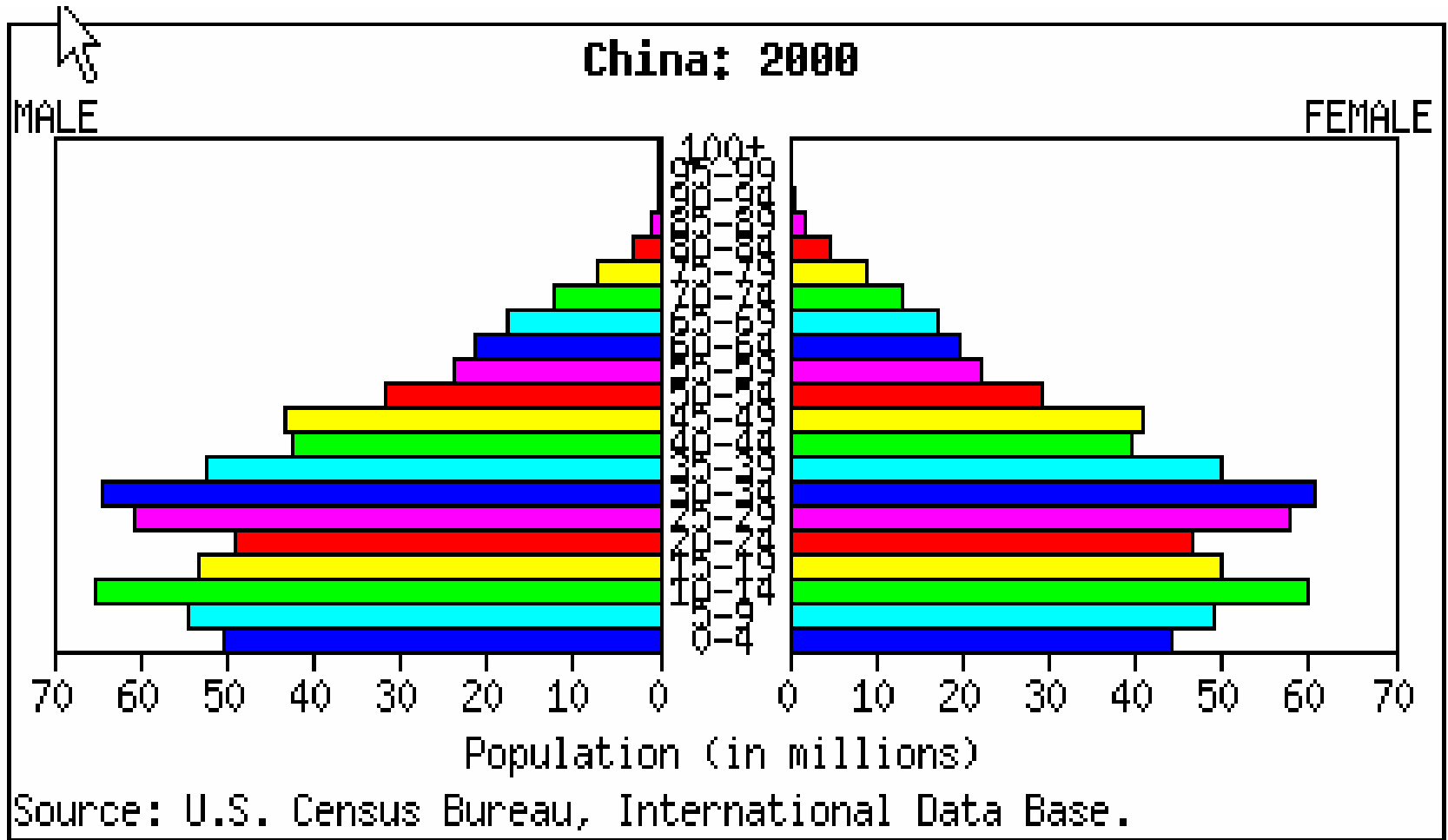
# India in 2000



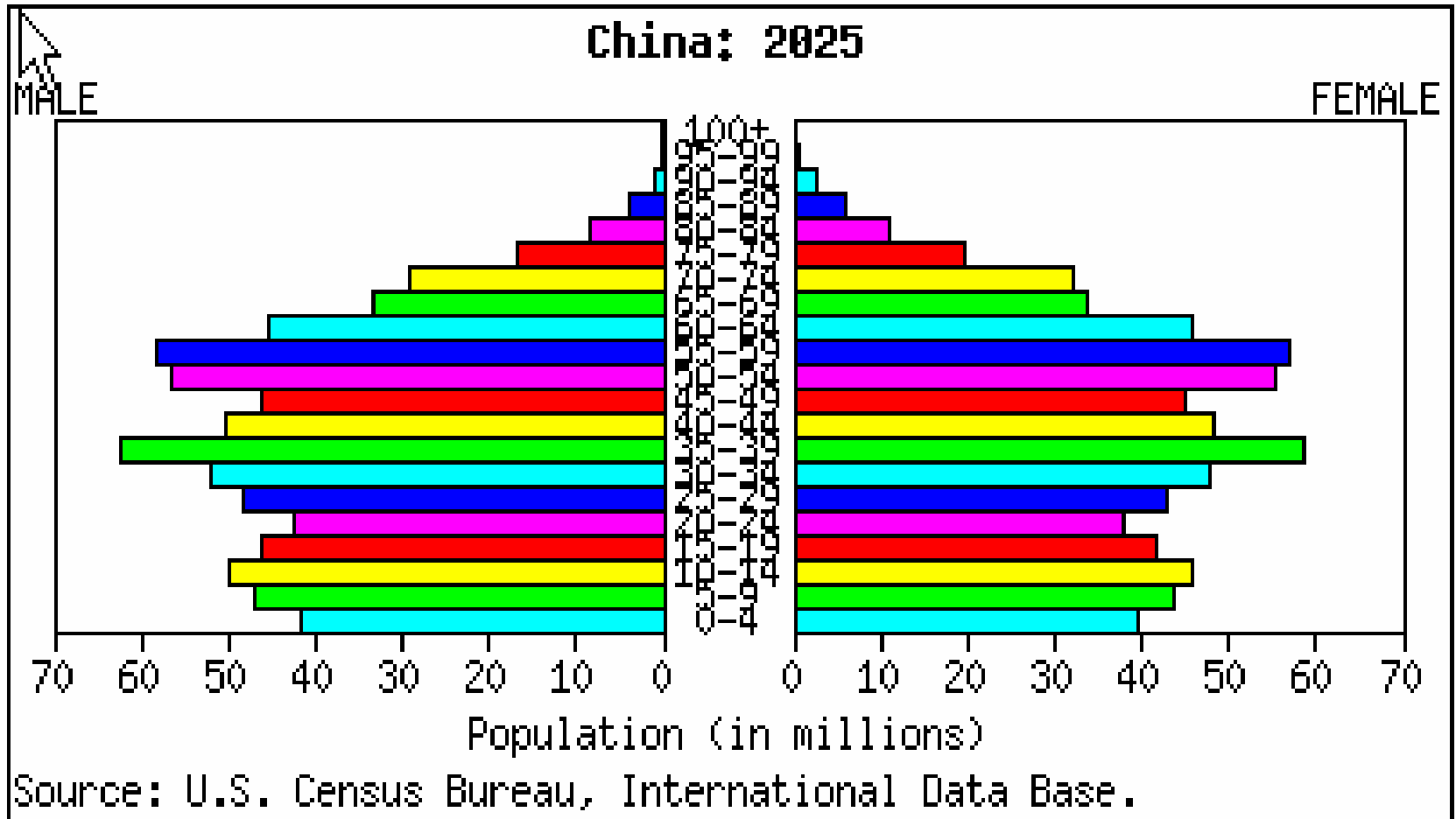
# India in 2025



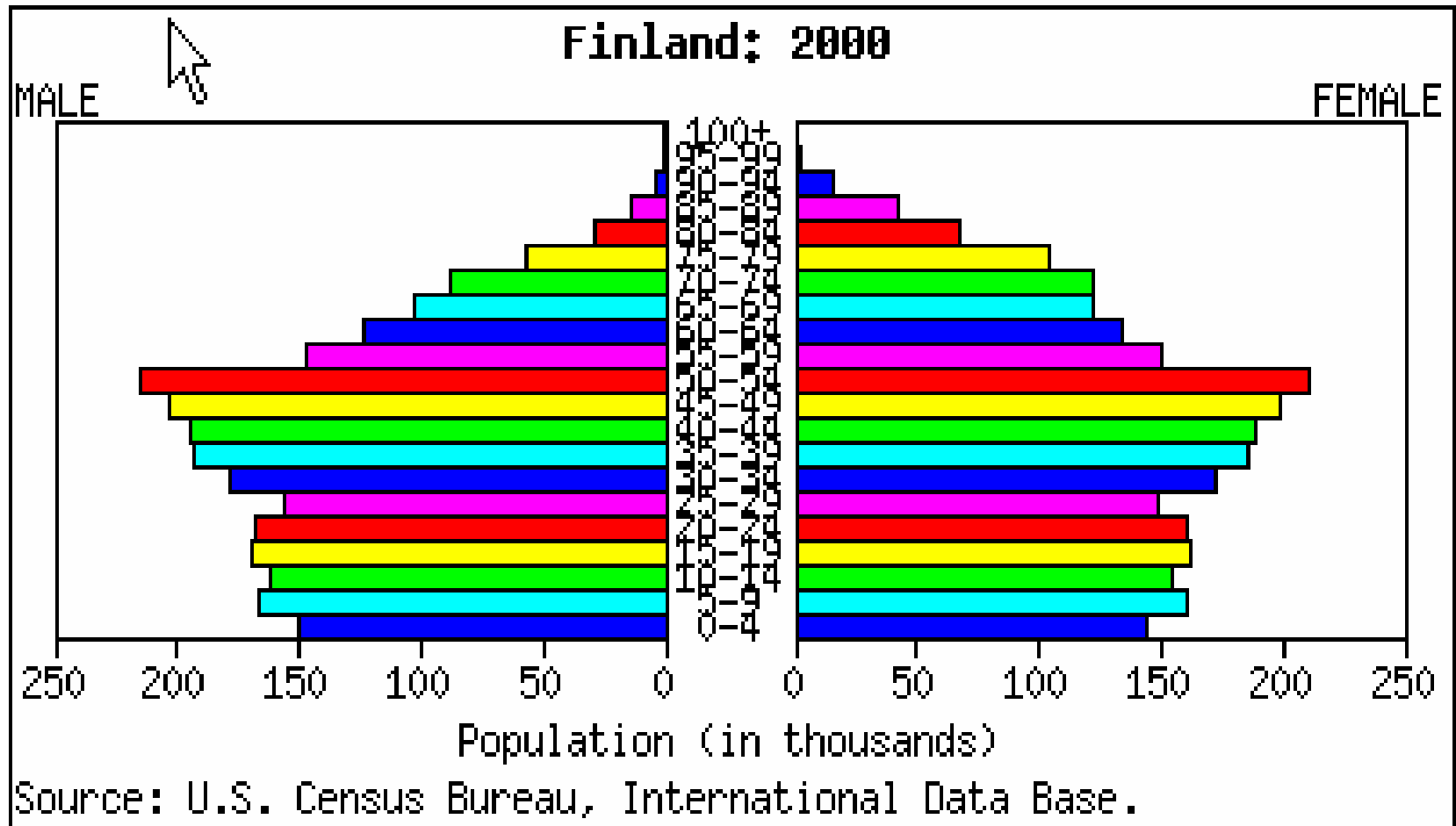
# China in 2000



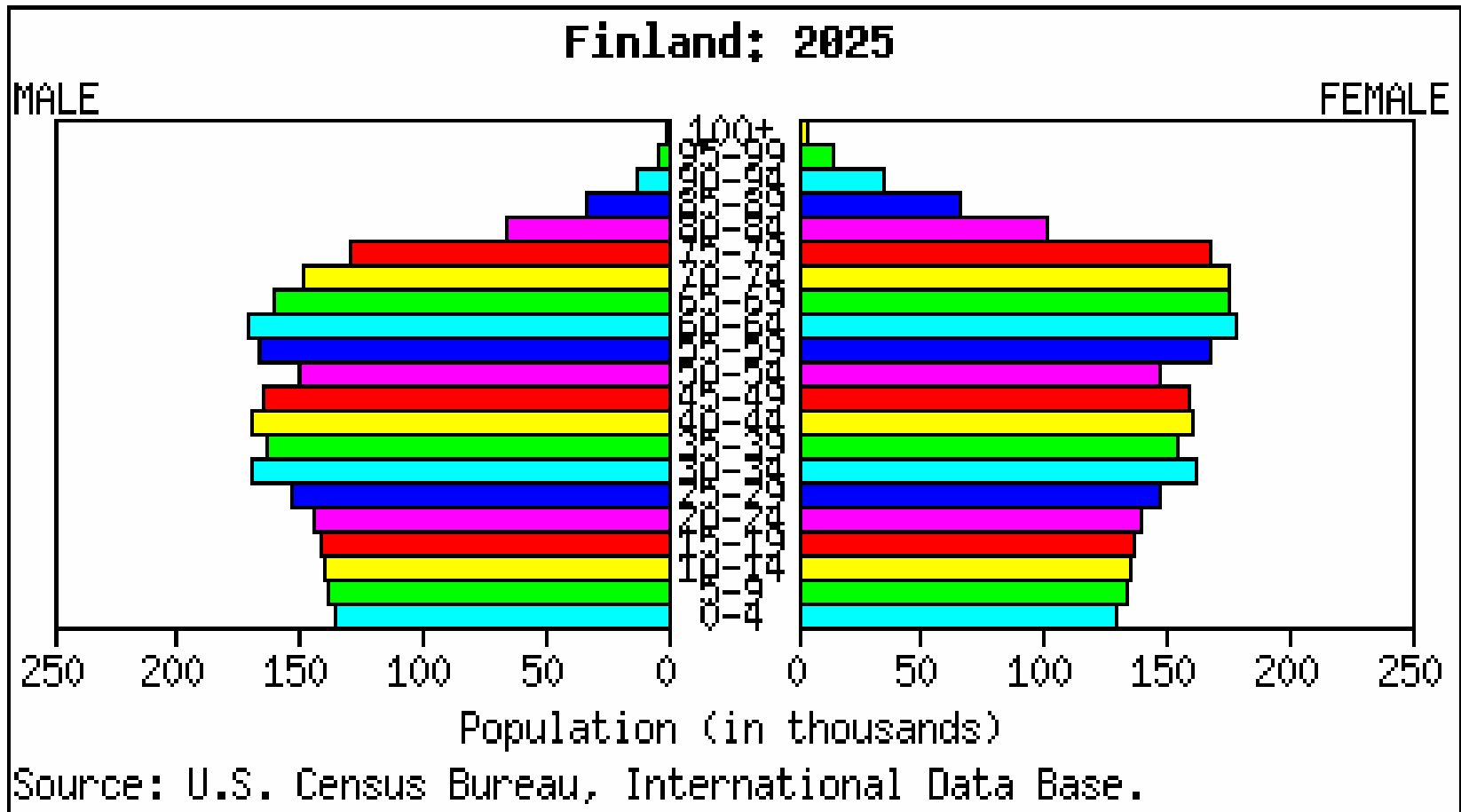
# China in 2025



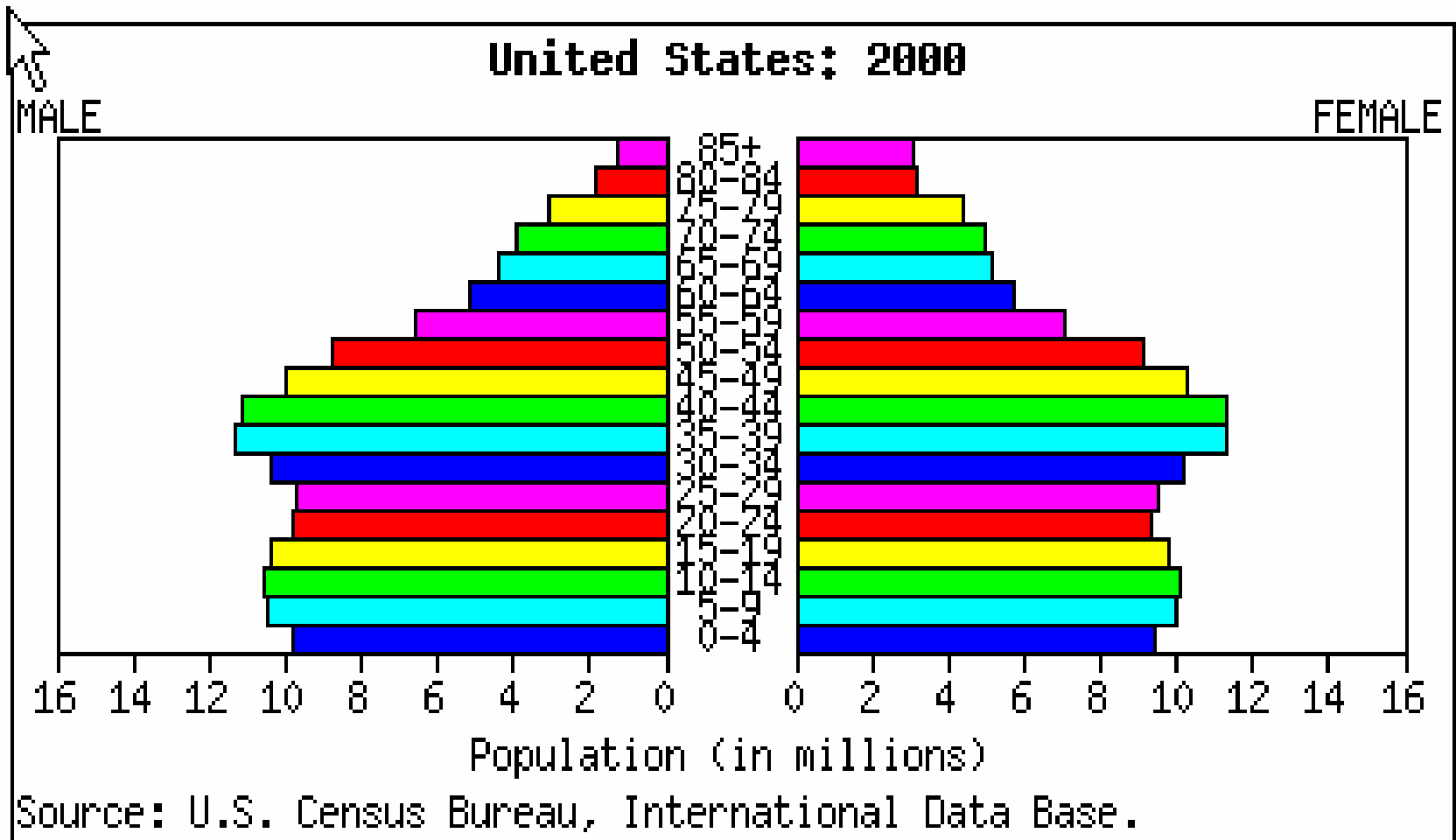
# Finland in 2000



# Finland in 2025



# USA in 2000



# USA in 2025

