INFECTION PREVENTION MARKET OVERVIEW

October 2015
INFECTION PREVENTION IS A LARGE AND GROWING INDUSTRY

The global infection prevention industry is a $140+ billion global market that is projected to grow ~6.2% annually to reach $231 billion in 2023

- Healthcare associated infections account for nearly 100,000 annual deaths in the U.S., making them the fourth leading cause of death behind heart disease, cancer, and stroke
- Driven by a variety of economic factors, demographic patterns, and healthcare trends, the U.S. infection prevention products and services industry is expected to grow at a 4.5% CAGR to $31 billion by 2023

GLOBAL AND U.S. INFECTION PREVENTION MARKET

GLOBAL AND U.S. INFECTION PREVENTION MARKET

(1) Source: Freedonia
(2) Source: Center for Disease Control and Prevention, American Cancer Society, and industry research

LEADING CAUSES OF DEATH IN THE U.S.

(1) Source: Freedonia
(2) Source: Center for Disease Control and Prevention, American Cancer Society, and industry research
U.S. Market Exhibits Strong Consistent Growth

The infection prevention industry is comprised of three main categories: infection prevention supplies, infection prevention services, and infection prevention equipment.

**Infection Prevention Supplies:** Protective apparel, safety enhanced medical devices, sterilization supplies, disinfectants, and waste disposal

**Infection Prevention Services:** Infectious waste disposal services and contract sterilization

**Infection Prevention Equipment:** Sterilization equipment, washing/disinfecting equipment, and other equipment

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**Infection Prevention Products and Services**

2023 Projected Infection Prevention Market in the U.S.

- Infection Prevention Supplies: 75%
- Infection Prevention Services: 21%
- Infection Prevention Equipment: 4%

$31 Billion

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**Infection Prevention Projected Growth**

($ in billions)

2015 – 2023 CAGRs:
- Total U.S.: 4.5%
- Supplies: 4.4%
- Services: 5.2%
- Equipment: 2.4%

Source: Freedonia
HEALTHCARE MARKETS BENEFIT FROM POSITIVE POPULATION TRENDS...

A growing population coupled with an increase in healthcare utilization and ultimately healthcare expenditures play a major role in the growing infection prevention industry.

WORLD POPULATION
- Globally, the number of adults over the age of 65 is expected to nearly triple between 2015 and 2050

ANNUAL U.S. HEALTHCARE VISITS
- The aging population will drive demand for healthcare
- In the U.S., the over 65 population utilizes the healthcare system on a consistent basis (10 or more times in a year) at a rate of 1.5 times higher than Americans aged 45 to 64, and 2.0 times higher than those aged 18 to 44

HEALTHCARE EXPENDITURES
- On a per capita basis, healthcare expenditures are expected to increase at a 4.8% CAGR from 2013 - 2018

World Population over the Age of 65
For the Years Ended and Ending 2015-2050

Percentage of Americans by Age with 10 or More Yearly Visits
For the Years Ended and Ending 2008-2018 ($ in actuals)

Per Capita U.S. Healthcare Expenditures
For the Years Ended and Ending 2008-2018 ($ in actuals)

Source:
(1) Pew Research Center
(2) Population in millions
(3) Department of Health and Human Services, CDC, and the National Ambulatory Medical Care Survey
(4) Freedonia
Increasing hospital admissions and outpatient visits help drive growth in infection prevention supplies, the core of the infection prevention industry.

- Infection prevention supplies such as exam gloves, patient gowns, safety enhanced syringes, and blood collection tubes will experience continued growth in order to continue to combat the number of healthcare associated infections which is expected to be over 2 million annually by 2023.
- The increase in hospital admissions and outpatient visits drive demand for a number of infection prevention supplies and services.
- The number of annual outpatient visits is expected to increase 1.8% annually to 4.9 billion visits in 2023.

### INCREASED OUTPATIENT VISITS
(in billions)

<table>
<thead>
<tr>
<th>Year</th>
<th>2003</th>
<th>2008</th>
<th>2013</th>
<th>2018</th>
<th>2023</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>3.4</td>
<td>3.7</td>
<td>4.1</td>
<td>4.4</td>
<td>4.9</td>
</tr>
</tbody>
</table>

**Growth rates:**
- 2003–2013: CAGR: 1.7%
- 2013–2023: CAGR: 1.8%

### GROWTH IN HOSPITAL ADMISSIONS
(in millions)

<table>
<thead>
<tr>
<th>Year</th>
<th>2003</th>
<th>2008</th>
<th>2013</th>
<th>2018</th>
<th>2023</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>41.3</td>
<td>43.1</td>
<td>44.9</td>
<td>46.8</td>
<td>49.0</td>
</tr>
</tbody>
</table>

**Growth rates:**
- 2003–2013: CAGR: 0.8%
- 2013–2023: CAGR: 0.9%

Source: Freedonia
…Which Correspond to Increased Surgical Volumes

In the U.S., growth in infection prevention products continues to be driven by surgical procedures:

- Infection prevention products continue to drive down healthcare associated infections relative to total surgical procedures
  - Growth in surgical procedures will continue to boost hospital demand for infection prevention products
- Historically, U.S. surgical procedures have increased at a CAGR of 2% from 2003 through 2013 while Healthcare Associated Infections have grown at a CAGR of 1%
  - Slowed growth in healthcare associated infections are a result of the increased focus on infection prevention

**U.S. SURGICAL PROCEDURES**

<table>
<thead>
<tr>
<th>Year</th>
<th>Procedures (in thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>68,500</td>
</tr>
<tr>
<td>2008</td>
<td>75,300</td>
</tr>
<tr>
<td>2013</td>
<td>81,500</td>
</tr>
<tr>
<td>2018</td>
<td>87,300</td>
</tr>
<tr>
<td>2023</td>
<td>93,000</td>
</tr>
</tbody>
</table>

2003–2013: CAGR: 2%
2013–2023: CAGR: 1%

**HEALTHCARE ASSOCIATED INFECTIONS**

<table>
<thead>
<tr>
<th>Year</th>
<th>Infections (in thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>1,770</td>
</tr>
<tr>
<td>2008</td>
<td>1,870</td>
</tr>
<tr>
<td>2013</td>
<td>1,940</td>
</tr>
<tr>
<td>2018</td>
<td>2,000</td>
</tr>
<tr>
<td>2023</td>
<td>2,050</td>
</tr>
</tbody>
</table>

2003–2013: CAGR: 2.6%
2013–2023: CAGR: 2.2%

Source: Freedonia
Infection prevention supplies, the largest segment of the market, can be broken down into five sub-categories totaling $23.1 billion in 2023.

### INFECTION PREVENTION SUPPLIES SUB-CATEGORIES

<table>
<thead>
<tr>
<th>Sub-category</th>
<th>2023P ($ in billions)</th>
<th>Growth Rate (through 2023)</th>
<th>Description</th>
</tr>
</thead>
</table>
| Infectious Waste Disposal                        | $23                    | 5.0%                        | - 5.0% annual growth expected through 2023  
- Select products include container liners, needle holders, and chemical decontaminants |
| Disinfectants                                    | $3                     | 3.8%                        | - 3.8% annual growth expected through 2023  
- Includes a variety of surface, surgical, and instrument disinfectants as well as hand sanitizers |
| Sterilization Supplies                           | $4                     | 4.0%                        | - 4.0% annual growth expected through 2023  
- Products include sterile containers, nonwoven and other wrap, and biological and chemical indicators used in reprocessing of products |
| Safety Enhanced Medical Devices                  | $8                     | 5.3%                        | - 5.3% annual growth expected through 2023  
- Select products include enhanced catheters, prefilled syringes, and blood collection tubes |
| Protective Apparel & Textiles                    | $9                     | 3.8%                        | - 3.8% annual growth expected through 2023  
- Includes items such as medical gloves, surgical drapes, and surgical gowns |

Source: Freedonia
Infection prevention services is the second largest segment of the market and includes two primary sub-categories:

- **Infectious Waste Disposal Services:**
  - 5.2% CAGR expected through 2023
  - Services include pick-up and removal of infectious waste items and other specialized activities such as processing of mail-in sharps containers

- **Contract Sterilization:**
  - 5.5% CAGR through 2023
  - Services include: gamma radiation, electron beam processing, and other device sterilization services

**Infection Prevention Services Market Overview**

- **Infectious Waste Disposal Services**
  - 2015 - 2023: CAGR 5.2%
  - Source: Freedonia

**Infection Prevention Services Breakdown**

- Infectious Waste Disposal: 86%
- Contract Sterilization: 14%

**Infection Prevention Services: Revenue by Sector**

- $6.4 Billion

- **Revenue by Year**
  - 2015: $4.3
  - 2016: $4.5
  - 2017: $4.7
  - 2018: $5.0
  - 2019: $5.3
  - 2020: $5.5
  - 2021: $5.8
  - 2022: $6.1
  - 2023: $6.4

- Source: Freedonia
The infection prevention equipment segment is expected to grow annually at 2.4% to $1.1 billion in 2023 and can be broken down into three primary sub-categories:

- **Sterilization Equipment:**
  - 1.4% annual growth expected through 2023
  - Sterilization equipment is largely comprised of gas plasma and peracetic acid systems and steam sterilizers

- **Washing/Disinfecting Equipment:**
  - 3.1% annual growth expected through 2023
  - Washing/disinfecting equipment is used to reprocess a variety of minimally invasive surgical instruments as well as bed frames, bedpans, glass labware, operating tables, patient carts, and other reusable supplies and devices

- **Other:**
  - 3.7% annual growth expected through 2023
  - Other infection prevention equipment includes processing equipment for infections waste disposal, scrub stations, clean rooms, and hyperbaric chambers

### INFECTION PREVENTION EQUIPMENT BREAKDOWN

- Sterilization Equipment: 46%
- Washing/Disinfecting Equipment: 35%
- Other: 19%

### INFECTION PREVENTION EQUIPMENT: REVENUE BY SECTOR

<table>
<thead>
<tr>
<th>Year</th>
<th>Sterilization Equipment</th>
<th>Washing/Disinfecting Equipment</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>$0.3</td>
<td>$0.3</td>
<td>$0.2</td>
</tr>
<tr>
<td>2016</td>
<td>$0.3</td>
<td>$0.3</td>
<td>$0.2</td>
</tr>
<tr>
<td>2017</td>
<td>$0.2</td>
<td>$0.3</td>
<td>$0.2</td>
</tr>
<tr>
<td>2018</td>
<td>$0.2</td>
<td>$0.3</td>
<td>$0.2</td>
</tr>
<tr>
<td>2019</td>
<td>$0.2</td>
<td>$0.3</td>
<td>$0.2</td>
</tr>
<tr>
<td>2020</td>
<td>$0.2</td>
<td>$0.3</td>
<td>$0.2</td>
</tr>
<tr>
<td>2021</td>
<td>$0.4</td>
<td>$0.2</td>
<td>$0.2</td>
</tr>
<tr>
<td>2022</td>
<td>$0.38</td>
<td>$0.2</td>
<td>$0.2</td>
</tr>
<tr>
<td>2023</td>
<td>$0.31</td>
<td>$0.2</td>
<td>$0.2</td>
</tr>
</tbody>
</table>

Source: Freedonia
# Regulatory Environment

## Infection Prevention Policy

- Direct U.S. government efforts related to infection prevention are included in the American Recovery and Reinvestment Act of 2009
- The Act allocated $50 million to state governments to develop infection prevention action plans and another $40 million to the CDC for establishing and coordinating HAI prevention efforts at the national level
- Most of this funding is aimed at the adoption of recommendations contained in the Action Plan to Prevent Health Care-Associated Infections

## Reimbursement

- Due to budgetary constraints and an overall paradigm shift to a value-based healthcare model, the government has lowered reimbursement rates for a number of services across the healthcare industry
- Infection prevention devices and products often do not have direct exposure to reimbursement risk as they are purchased by healthcare facilities and physician and dental practices
- While these products and services are not reimbursable expenses, they are widely considered necessary for the day-to-day operations within these settings

## Medical Device Excise Tax

- As part of the ACA, the IRS imposed a 2.3% excise tax on the sale price of certain medical devices within the U.S., effective December 2012
- A taxable medical device is one that is listed under section 510(k) of the Federal Food, Drug, and Cosmetic Act, unless the device falls within an exemption category
  - The retail exemption includes devices “to be of a type that is most commonly purchased by the general public at retail for individual use"
- Political discussions about potentially repealing all or a portion of the tax are ongoing with bipartisan support for a full repeal
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