In the United States, more than **65 million people** are currently living with an incurable sexually transmitted disease (STD). An additional 15 million people become infected with one or more STDs each year, roughly half of whom contract lifelong infections. Yet, STDs are one of the least recognized health problems in the country today.

**Epidemiology of AIDS in the US**

*Fig. 6.1 Appearance of AIDS in the US*

*HIV positives with <200 T-helper cells/ml*
CDC now estimates that 1.1 million adults and adolescents (prevalence rate: 447.8 per 100,000 population) were living with diagnosed or undiagnosed HIV infection in the United States at the end of 2006.

56,000 new HIV infections are estimated to occur annually
Distribution of AIDS cases in US by risk group

- Children Born to HIV-Infected Mothers (1.2%)
- Others (1.1%)
- Homosexual and Bisexual Men (45.9%)
- Heterosexual Contact with HIV-Infected Individuals (28%)
- Blood Transfusion Recipients and Hemophiliacs (<0.5%)
- Heterosexual Injection Drug Users (18.5%)
- Homosexual/Bisexual Men Injection Drug Users (5.1%)

Fig. 6.2

AIDS cases by ethnicity in US

- White (75%)
- African American (12%)
- Hispanic (9%)
- Other (4%)

Percentage of Total Population

- White (40%)
- African American (42%)
- Hispanic (17%)
- Other (1%)

Percentage of Total AIDS Cases

- White (20.2%)
- African American (52.8%)
- Hispanic (25.6%)
- Other (1.4%)

Percentage of Heterosexual Injection Drug-Associated AIDS Cases

~60% minority

~79% minority
The frequency of AIDS in AA and Hispanics is about 3-5 times higher than in the general population. AIDS is the leading cause of death of AA women (25-34 yrs) and men 35-44 yrs of age.

19% of cases are women.

**HIV Infection in Homosexual Men: Relative Risk**

**Table 6-2**

<table>
<thead>
<tr>
<th>Sexual Practices for the Preceding Two Years</th>
<th>Percent HIV Seropositive (Adjusted for Number of Sexual Contacts)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No anal sex</td>
<td>20.6%</td>
</tr>
<tr>
<td>Anal sex, insertive only</td>
<td>26.7%</td>
</tr>
<tr>
<td>Anal sex, receptive only</td>
<td>44.6%</td>
</tr>
<tr>
<td>Anal sex, both insertive and receptive</td>
<td>53.3%</td>
</tr>
</tbody>
</table>
HIV Infection in Casual Household Contact of AIDS Patients

Table 6-3

<table>
<thead>
<tr>
<th></th>
<th>Number Tested</th>
<th>Number HIV Seropositive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children less than 6 years old</td>
<td>21</td>
<td>1⁺</td>
</tr>
<tr>
<td>Offspring of an AIDS patient</td>
<td>15</td>
<td>1⁺</td>
</tr>
<tr>
<td>Offspring of others</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Children 6 to 18 years old</td>
<td>47</td>
<td>0</td>
</tr>
<tr>
<td>Adults</td>
<td>33</td>
<td>0</td>
</tr>
<tr>
<td>Total tested</td>
<td>101</td>
<td></td>
</tr>
</tbody>
</table>

Neither Casual contact nor insect bites have been linked to HIV cases

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Long-Term Results of HIV Infected Men:

Table 6-4

<table>
<thead>
<tr>
<th></th>
<th>Number of Individuals</th>
<th>Percent Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIDS</td>
<td>10</td>
<td>17.5</td>
</tr>
<tr>
<td>Signs of Immunological Damage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LAS</td>
<td>16</td>
<td>28.1</td>
</tr>
<tr>
<td>Others (oral candidiasis, weight loss, etc.)</td>
<td>11</td>
<td>19.3</td>
</tr>
<tr>
<td>Subtotal</td>
<td>27</td>
<td>47.4</td>
</tr>
<tr>
<td>Asymptomatic</td>
<td>20</td>
<td>35.1</td>
</tr>
</tbody>
</table>

44 months after HIV detection
# Effects of AZT treatment on survival of AIDS patients

**Table 6-5**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Number of Subjects</th>
<th>Number of Deaths</th>
<th>Percent Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>None (Placebo pills)</td>
<td>97</td>
<td>19</td>
<td>19.6</td>
</tr>
<tr>
<td>AZT</td>
<td>124</td>
<td>1</td>
<td>0.8</td>
</tr>
</tbody>
</table>

*The subjects were in the study an average of 16–17 weeks. The study was intended to last 24 weeks (8 months), but it was terminated early once the dramatic effect of AZT treatment became evident. All subjects were offered AZT at that time. Data from the report of the first large-scale test of AZT by M. A. Fischl, et al., *N. Engl. J. Med.* 317 (1987): 185-191.

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**AIDS AROUND THE WORLD**

![Diagram showing AIDS transmission routes in 1986 and 2007](image)

**Fig. 6-4**

- **1986**: 17% Injection Drug Users (IDU) (17%), 3.3% Homosexual/Bisexual Men (MSM) (65%)
- **2007**: 28% Heterosexual Contact (28%), 18% Injection Drug Users (IDU) (18.2%), 5.1% MSM/IDU

**1986**

- Blood Transfusion Recipients (2%)
- Hemophiliacs (0.9%)
- Injection Drug Users (IDU) (17%)
- MSM/IDU (8%)

**2007**

- Children Born to HIV-Infected Mothers (1.2%)
- Other (1.1%)
- Homo/hemophiliacs/blood transfusion recipients (< 0.5%)
- MSM/IDU (5.1%)
Due to HIV deaths

**Fig. 6-7**

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**OVERVIEW OF THE GLOBAL AIDS EPIDEMIC**

On a global scale, the HIV epidemic has stabilized, although with unacceptably high levels of new HIV infections and AIDS deaths.

- Globally, there were an estimated 33 million [30.3 million–36.1 million] people living with HIV in 2007 (Figure 2.2).
- The annual number of new HIV infections declined from 3.0 million [2.6 million–3.5 million] in 2001 to 2.7 million [2.2 million–3.2 million] in 2007.
- Overall, 2.0 million [1.8 million–2.3 million] people died due to AIDS in 2007, compared with an estimated 1.7 million [1.5 million–2.3 million] in 2001.
- While the percentage of people living with HIV has stabilized since 2000, the overall number of people living with HIV has steadily increased as new infections occur each year, HIV treatments extend life, and a new infections still outnumber AIDS deaths (Figure 2.3).
- Southern Africa continues to bear a disproportionate share of the global burden of HIV: 35% of HIV infections and 38% of AIDS deaths in 2007 occurred in that subregion. Altogether, sub-Saharan Africa is home to 67% of all people living with HIV.

**UNAIDS**

Women account for half of all people living with HIV worldwide, and nearly 60% of HIV infections in sub-Saharan Africa. Over the last 10 years, the proportion of women among people living with HIV has remained stable globally, but has increased in many regions (Figure 2.4).

Young people aged 15–24 account for an estimated 45% of new HIV infections worldwide.

An estimated 370 000 [330 000–410 000] children younger than 15 years became infected with HIV in 2007. Globally, the number of children younger than 15 years living with HIV increased from 1.6 million [1.4 million–2.1 million] in 2001 to 2.0 million [1.9 million–2.3 million] in 2007. Almost 90% live in sub-Saharan Africa (see box “HIV among children”).
Among this group of patients, "the estimated prevalence of resistance to one or more drugs within each of the three drug classes ranged from 71.4% for nucleoside reverse transcriptase inhibitors to 40.5% for protease inhibitors and 25.2% for non-nucleoside reverse transcriptase inhibitors," they report.

About 13% of samples from viremic patients were resistant to all three drug classes.

HIV drug resistance was significantly more common in patients with advanced HIV disease, higher plasma viral loads, and lower CD4 cell counts as well as in "early adopters" of HAART or early users of nucleoside analogs.

07/30/04
HIV has increased 20-fold in Eastern and central Europe in the past decade.

HIV is now in China (650,000) mostly IV Drug users

Russia now has the largest AIDS epidemic in Europe (1 million)

HIV is spreading rapidly in the Ukraine and Papua, New Guinea
HIV mutates quickly and there are now many subtypes of this virus

**Evolutionary Relationships of HIV-1 Subtypes**

- **M** is the major subgroup and it has been divided into 10 different subtypes or clades.
• HIV has evolved by mutation as it replicates over time.

• Changes in outer glycoproteins on the viral envelope change the antigenic “face” of the virus creating clades.

• In the U.S. the predominant clade is B whereas in Africa it is C and in Thailand, E & C.

• Monitoring the spread of the virus therefore requires recognition of various clades.