State of the ART - Adolescents living with HIV

Elaine Abrams, ICAP at Columbia
CQUIN Learning Network
Differentiated Care for Adolescents
October 25, 2017
State of the ART

• Why differentiated service delivery (DSD) for adolescents with HIV?
  • Precision public health to improve health outcomes
• Adolescents with HIV – who are they?
• How are they doing?
• Painting a picture of DSD for adolescents with HIV
# Global summary of the AIDS epidemic | 2016

## Number of people living with HIV

<table>
<thead>
<tr>
<th>Category</th>
<th>Total</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>36.7 million</td>
<td>[30.8 million–42.9 million]</td>
</tr>
<tr>
<td>Adults</td>
<td>34.5 million</td>
<td>[28.8 million–40.2 million]</td>
</tr>
<tr>
<td>Women (15+ years)</td>
<td>17.8 million</td>
<td>[15.4 million–20.3 million]</td>
</tr>
<tr>
<td>Children (&lt;15 years)</td>
<td>2.1 million</td>
<td>[1.7 million–2.6 million]</td>
</tr>
</tbody>
</table>

## People newly infected with HIV in 2016

<table>
<thead>
<tr>
<th>Category</th>
<th>Total</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.8 million</td>
<td>[1.6 million–2.1 million]</td>
</tr>
<tr>
<td>Adults</td>
<td>1.7 million</td>
<td>[1.4 million–1.9 million]</td>
</tr>
<tr>
<td>Children (&lt;15 years)</td>
<td>160 000</td>
<td>[100 000–220 000]</td>
</tr>
</tbody>
</table>

## AIDS-related deaths in 2016

<table>
<thead>
<tr>
<th>Category</th>
<th>Total</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.0 million</td>
<td>[830 000–1.2 million]</td>
</tr>
<tr>
<td>Adults</td>
<td>890 000</td>
<td>[740 000–1.1 million]</td>
</tr>
<tr>
<td>Children (&lt;15 years)</td>
<td>120 000</td>
<td>[79 000–160 000]</td>
</tr>
</tbody>
</table>

UNAIDS
Global AIDS Deaths, 1990-2016

UNAIDS. Ending AIDS. Progress towards the 90-90-90 targets, 2017
Improvement in life expectancy at birth in select African countries

UNAIDS. Ending AIDS. Progress towards the 90-90-90 targets, 2017
About 5000 new infections each day in adults and children | 2016

- About 64% are in Sub Saharan Africa
- About 400 are among children under 15 years of age
- About 4500 are among adults aged 15 years and older of whom:
  - Almost 43% are among women
  - About 37% are among young people (15-24 years)
  - About 22% are among young women (15-24 years)
Ending AIDS as a public health threat by 2030 – a long way to go

- Somewhat more than half of the estimated number of people living with HIV are receiving ART
- An ambitious set of programme-coverage targets to be achieved by 2020:
  - Three nineties: 90 percent of people living with HIV knowing their status; 90 percent of those with known status on ART; 90 percent on ART virally suppressed
  - Access to comprehensive HIV prevention by 90 percent of people in need
- Even more ambitious goals for 2030
  - Three Zeros: zero new HIV infections, zero discrimination; zero AIDS-related deaths.
“A client-centered approach that simplifies and adapts HIV services across the cascade to reflect the preferences and expectations of various groups of people living with HIV while reducing unnecessary burdens on the health system.”
State of the ART

• Why differentiated service delivery (DSD) for adolescents with HIV?
  • Precision public health to improve health outcomes

• **Adolescents with HIV – who are they?**

• How are they doing?

• Painting a picture of DSD for adolescents with HIV
Confusing categories and definitions: adolescence, youth, young adulthood

- Adolescence: a transitional stage of physical and mental development that occurs between childhood and adulthood
  - WHO: period of life between 10 and 19 years
  - Early adolescence: 10-13 or 10-15 years
- Youth: defined by their age group
  - WHO: period of life between 15 and 24 years
- Young people:
  - WHO: individuals aged 10-24 years
Adolescence: a time of change

Physical growth

Puberty & sexual maturation

Psychological and neurocognitive development

Separation and individuation
Adolescence: a period of significant physical, emotional and social development and change

**Childhood**
- Dependence on parent/family/adults
- Physical and emotional growth and development
- Adult supervision and decision-making
- Education and learning
- No sex, substances (alcohol, drugs, cigarettes)
- Supervised healthcare

**Adulthood**
- Independence
- Education complete
- Employment
- Residential independence
- Dating/partner/marriage
- Pregnancy/parenthood
- Sexual relationships
- Healthcare self-management

**HIV INFECTION**

**ADOLESCENCE**

** Anatomy of a Teenager's Brain**

- Embarrassed by parents section
- Prefrontal
- Girls are suddenly fascinating section
- Ability to listen to extremely loud bus tracks
- Ability to remember the lyrics to offensive hip hop song
- Have no idea...
- Cars, cars, cars, cars, and oh, yeah, girls...
- School Work (perceived amount of the future)
An unfortunate state of mind, or is it?
Risk taking during adolescence - Prevailing theory blames it on the brain

• Increase in morbidity and mortality during adolescence associated with rise in risk behaviors:
  • Substance abuse, unprotected sex, antisocial acts, reckless & drunk driving

• Studies suggest risk-taking can be attributed to:
  • Immature/evolving neural system integration and efficiency, prefrontal cortex, limbic system, related structures
  • Limitations in executive function (cognitive processes associated with ability to carry out goal-directed behavior, impulse control, self-monitoring)
  • Personality traits of impulsivity, sensation-seeking, aggression and sociability were related to increased levels of risky behavior
  • “The brain’s inhibitory system does not match the demands of the excitatory or sensation-seeking systems, resulting in increased participation in risky behaviors.”
Risky taking during adolescence: an emerging theory suggests an adaptive need to gain experience

• Teens have heightened attraction to novel, exciting experiences known as sensation seeking, peaking during adolescence.

• Adolescents lack experience so they are try things for the first time – like learning how to drive. They also try drugs, decide what to wear, whom to hang out with.

• For some youth, this leads to problems but for the vast majority of adolescents this period passes without major catastrophe.
  • A smaller subset of teens, those who exhibit impulsive behavior and have weak cognitive control – who are at most risk of unhealthy outcomes.

• The increase in risk taking by adolescents is an adaptive need to gain experience required to assume adult roles and behaviors.
  • The reason teens are doing all this exploring and novelty seeking is to build experience so that they can do a better job in making the difficult and risky decisions in later life.
Why dropping out of college was the best decision I ever made.
State of the ART

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- How are they doing?
- Painting a picture of DSD for adolescents with HIV
Global summary of the HIV epidemic among adolescents, (10-19 yrs), 2015

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Female</th>
<th>Male</th>
<th>sub-Saharan Africa (% of global)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated number of adolescents (10–19 yrs.) living with HIV</td>
<td>1,800,000</td>
<td>990,000</td>
<td>780,000</td>
<td>80</td>
</tr>
<tr>
<td>Estimated number of adolescents (15–19 yrs.) newly infected with HIV</td>
<td>250,000</td>
<td>160,000</td>
<td>87,000</td>
<td>68</td>
</tr>
<tr>
<td>Estimated number of adolescents (10–19 yrs.) dying of AIDS-related causes</td>
<td>41,000</td>
<td>20,000</td>
<td>21,000</td>
<td>87</td>
</tr>
</tbody>
</table>

UNAIDS 2016 estimates
4,500 new HIV infections among adults (aged 15 years and older) every day

37% Among young people (aged 15-24 years)

- Among young women (15-24 years)
- Among young men (15-24 years)

AVERT.org  Source: UNAIDS 2017
New infections among 15-19 year olds have declined but more slowly than children < 15 years of age

UNAIDS 2016 estimates
HIV Trends among Adolescents

Progress Toward 90-90-90 Among Adolescents & Adults 3-Country Combined: Zambia, Zimbabwe, Malawi

*The number within each bar represents the conditional percentage while the height of each bar represents the absolute percentage of all PLHIV.
90-90-90 Targets by Age, Swaziland HIV Impact Assessment

*The number within each bar represents the conditional percentage while the height of each bar represents the absolute percentage of all PLHIV.*
Rates of viral suppression among 1547 youth with behaviorally acquired HIV, US

Kahana, JAIDS, 2015
Rates of viral suppression among 649 youth with perinatal HIV infection, US

Proportion of adolescents

Time since diagnosed with HIV

0-5yr (n=93)  8-10yr (n=107)  >11yr (n=335)

Kahana, JAIDS, 2015
Characteristics of people living with perinatally acquired HIV, NYC, Dec 2014

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Unweighted number</th>
<th>Number infected with HIV (weighted percent)</th>
<th>Number diagnosed with HIV (weighted percent)</th>
<th>Number in care (weighted percent of those diagnosed with HIV)</th>
<th>Number in continuous care (weighted percent of those in care)</th>
<th>Number virally suppressed (weighted percent of those in continuous care)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>1,536</td>
<td>1,596 (100)</td>
<td>1,596 (100)</td>
<td>1,535 (96)</td>
<td>1,278 (80)</td>
<td>973 (61)</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>730</td>
<td>768 (48)</td>
<td>768 (100)</td>
<td>729 (95)</td>
<td>594 (77)</td>
<td>464 (60)</td>
</tr>
<tr>
<td>Female</td>
<td>806</td>
<td>828 (52)</td>
<td>828 (100)</td>
<td>806 (97)</td>
<td>684 (83)</td>
<td>508 (61)</td>
</tr>
<tr>
<td>Race/ethnicity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>868</td>
<td>907 (57)</td>
<td>907 (100)</td>
<td>867 (96)</td>
<td>728 (80)</td>
<td>534 (59)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>588</td>
<td>608 (38)</td>
<td>608 (100)</td>
<td>588 (97)</td>
<td>486 (80)</td>
<td>376 (62)</td>
</tr>
<tr>
<td>White</td>
<td>60</td>
<td>61 (4)</td>
<td>61 (100)</td>
<td>60 (98)</td>
<td>46 (75)</td>
<td>46 (75)</td>
</tr>
<tr>
<td>Other</td>
<td>20</td>
<td>20 (1)</td>
<td>20 (100)</td>
<td>20 (98)</td>
<td>18 (88)</td>
<td>16 (80)</td>
</tr>
<tr>
<td>Age, in years</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>21</td>
<td>21</td>
<td>21</td>
<td>21</td>
<td>21</td>
<td>21</td>
</tr>
<tr>
<td>Median</td>
<td>22</td>
<td>22</td>
<td>22</td>
<td>22</td>
<td>22</td>
<td>21</td>
</tr>
<tr>
<td>0–12</td>
<td>109</td>
<td>109 (7)</td>
<td>109 (100)</td>
<td>108 (99)</td>
<td>97 (89)</td>
<td>80 (73)</td>
</tr>
<tr>
<td>13–19</td>
<td>402</td>
<td>405 (25)</td>
<td>405 (100)</td>
<td>402 (99)</td>
<td>362 (89)</td>
<td>270 (67)</td>
</tr>
<tr>
<td>20–29</td>
<td>935</td>
<td>987 (62)</td>
<td>987 (100)</td>
<td>935 (95)</td>
<td>749 (76)</td>
<td>568 (58)</td>
</tr>
<tr>
<td>30–36</td>
<td>90</td>
<td>96 (6)</td>
<td>96 (100)</td>
<td>90 (94)</td>
<td>70 (73)</td>
<td>54 (56)</td>
</tr>
</tbody>
</table>

Xia, Public Health Reports, 2016
Rates of viral suppression among those with perinatal HIV, NYC 2014
Factors associated with self-reported adherence among 519 HIV+ adolescents, 12-18 years, Malawi

Table 3. Multivariate Logistic Regression Model of factors associated with self-reported non-adherence (7 day recall)

<table>
<thead>
<tr>
<th>Variable</th>
<th>OR</th>
<th>[95% CI]</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>0.97</td>
<td>0.87</td>
<td>1.1</td>
</tr>
<tr>
<td>Female</td>
<td>1.06</td>
<td>0.71</td>
<td>1.58</td>
</tr>
<tr>
<td>Missed clinic appointment in past 6 months</td>
<td>2.23</td>
<td>1.43</td>
<td>3.49</td>
</tr>
<tr>
<td>Self-efficacy measure: not extremely sure</td>
<td>1.55</td>
<td>1.02</td>
<td>2.34</td>
</tr>
<tr>
<td>Witnessed and experienced household violence in the past year(^a)</td>
<td>1.86</td>
<td>1.08</td>
<td>3.21</td>
</tr>
<tr>
<td>Alcohol use in the past month</td>
<td>4.96</td>
<td>1.41</td>
<td>17.44</td>
</tr>
</tbody>
</table>

Kim, JIAS 2017
Rates of behavioral health problems among 246 youth with perinatal HIV and 134 with HIV-exposed, uninfected youth

- 20% of 18-26 yr had a mental health condition, past year (SAMHSA, 2014)
- 17% of 18-25 yr had substance dependence/abuse, past year (SAMHSA, 2014)

Mellins, CASAH Cohort
Transition milestones among 246 youth with perinatal HIV and 134 with HIV-exposed, uninfected youth

- HS/GED: 84% PHIV+, 77% PHIV-
- Working/in school: 59% PHIV+, 61% PHIV-
- Stable housing: 94% PHIV+, 98% PHIV-
- Paying rent*: 54% PHIV+, 22% PHIV-
- Ever in relationship: 95% PHIV+, 92% PHIV-

Mellins, CASAH Cohort
Demand for family planning satisfied by modern methods among young women, 15-24 years, 2010-2015

DHS surveys 2010-2015
Pregnancy in perinatally-infected females


<table>
<thead>
<tr>
<th>Author (Journal)</th>
<th>Year (place)</th>
<th># Perinatal Girls</th>
<th># Pregnancies</th>
<th># Infected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Croucher Sex Trans Inf</td>
<td>2013 (UK)</td>
<td>Cohort: 6/31 (19%)</td>
<td>8</td>
<td>0/3 live birth</td>
</tr>
<tr>
<td>Munjal Adol Health Med Th</td>
<td>2013 (Bronx)</td>
<td>Case rpt: 30</td>
<td>37</td>
<td>1/37 live birth</td>
</tr>
<tr>
<td>Badell (Infect Dis Obstet Gynecol)</td>
<td>2013 (US)</td>
<td>Cohort: 20</td>
<td>20</td>
<td>1/20</td>
</tr>
<tr>
<td>Byrne (AIDS)</td>
<td>2017 (UK)</td>
<td>Cohort: 630</td>
<td>70</td>
<td>3/59 live births</td>
</tr>
<tr>
<td>Hleyhel (CROI 2017)</td>
<td>2017 (France)</td>
<td>Cohort: 46/1425 (3.2%)</td>
<td>64</td>
<td>0/64</td>
</tr>
<tr>
<td>Jao J (Clin Infect Dis)*</td>
<td>2017 (US)</td>
<td>Cohort: 235/2270 (10.4%)</td>
<td>270</td>
<td>0</td>
</tr>
<tr>
<td>Prieto LM (PLoS One)</td>
<td>2017 (Spain)</td>
<td>Cohort: 22</td>
<td>28</td>
<td>0</td>
</tr>
<tr>
<td>Meloni (AIDS Care)</td>
<td>2009 (Italy)</td>
<td>Case rpt: 2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Williams (Am J Ob/Gyn)</td>
<td>2009 (Newark)Case rpt: 10</td>
<td>13</td>
<td>1/7 live birth</td>
<td></td>
</tr>
<tr>
<td>Cruz (AIDS)</td>
<td>2010 (Brazil)Case rpt: 11</td>
<td>15</td>
<td>0/15 live birth</td>
<td></td>
</tr>
<tr>
<td>Phillips (AIDS Care)</td>
<td>2011 (US)</td>
<td>Case rpt: 11</td>
<td>15</td>
<td>0/15 live birth</td>
</tr>
<tr>
<td>Kenny (J HIV Med)</td>
<td>2012 (UK/Ireland) Cohort: 30/252 (12%)</td>
<td>42</td>
<td>1/21 live birth</td>
<td></td>
</tr>
<tr>
<td>Jao (AIDS)</td>
<td>2012 (NYC)</td>
<td>Case rpt: 14</td>
<td>17</td>
<td>0/19 live birth</td>
</tr>
<tr>
<td>Millery (J Ass Nurs AIDS Care)</td>
<td>2012 (NYC)</td>
<td>Cohort: 25/97 (26%)</td>
<td>33</td>
<td>0/19 live birth</td>
</tr>
</tbody>
</table>

Adapted from Mofenson
Deaths have declined significantly among all age groups except adolescents 10-19 years
Top five causes of death for all adolescents, globally, 10-19 years in 2015

<table>
<thead>
<tr>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Road traffic injury</td>
<td>• Lower respiratory infections</td>
</tr>
<tr>
<td>• Interpersonal violence</td>
<td>• Self-harm</td>
</tr>
<tr>
<td>• Drowning</td>
<td>• Diarrheal diseases</td>
</tr>
<tr>
<td>• Lower respiratory infections</td>
<td>• Maternal conditions*</td>
</tr>
<tr>
<td>• Self-harm</td>
<td>• Leading cause of death in 15-19yrs</td>
</tr>
<tr>
<td></td>
<td>• Road traffic injury</td>
</tr>
</tbody>
</table>

*LMIC in Africa, communicable diseases such as HIV/AIDS, lower respiratory infections, meningitis, and diarrheal diseases are bigger causes of death among adolescents than road injuries.

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  • Precision public health to improve health outcomes
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• How are they doing?
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The burden of HIV infection

• Adolescence is a time of growth and development
  • A complex, rich, confusing and challenging period of transition from childhood to adulthood

• Adolescents with HIV are a very heterogeneous group

• HIV creates additional burdens and stresses on individuals living with HIV
  • Lifelong daily medication; frequent medical visits; partner disclosure; condom use

• In many settings, community, families and health systems are not aligned to support adolescents as they transition to adulthood, particularly adolescents with HIV
  • Stigma, policy and legislation, guidelines, health and educational services
Optimizing outcomes for adolescents and young adults living with HIV

• To address the needs of adolescents living with HIV it will be critical to address their needs as adolescents and young adults

• My list of essentials
  • Progressive policies, guidance, legal framework
  • Good drugs (until we have a cure)
  • Accessible services
  • Well trained, respectful, nonjudgmental healthcare providers
  • Integrated sexual and reproductive healthcare
  • Integrated behavioral and mental health services
  • Inclusive of family, friends and peers
Get your pastels and paintbrushes. It’s time to listen, learn and co-create

Think like an adolescent

❖ Be imaginative
❖ Take risks, try new things, be bold
❖ Rely on your friends, peers and this extended family
❖ Employ technology
❖ Have fun
❖ Achieve great things
The CQUIN Learning Network
Differentiated Service Delivery for Adolescents

THANK YOU!