

# STANDARD DEVIATIONS: Personal Personal Protective Equipment

Greetings,

**HIV IS A DEADLY DISEASE.** Millions have died and millions are infected around the world. The human immunodeficiency virus infects T Helper lymphocytes that are CD4+. When CD4+ T cell numbers decline below a critical level, cell-mediated immunity is lost, and the body becomes more-and-more susceptible to opportunistic infections. There is no vaccine.

**HIV IS A U.S. VIRAL EPIDEMIC.** 1.1 million people in the U.S. are living with HIV today. 1 in 7 don't know it. 38,000 new HIV infections occur in the United States each year. There is no vaccine.

**HIV IS A BLOODBORNE PATHOGEN.** HIV is transmitted through blood, semen and pre-seminal fluids, rectal fluids, vaginal fluids, and breast milk. It's a threat to us in the lab through direct contact with these fluids and infected sharps. There is no vaccine.

**HIV IS SEXUALLY TRANSMITTED.** This is the primary mode of transmission. Male to male sex is the leader but HIV is transmissible through heterosexual contact and from mother to fetus, and mother to child. There is no vaccine.

**HIV IS AN ISSUE IN UTAH.** In Utah, there were 2,965 individuals living with diagnosed HIV at the end of 2017. The rate of PLWDH has been increasing slowly for the last five years. In 2013, there were 92.3 people living with HIV per 100,000 Utah residents. By 2017, the rate increased to 95.6 per 100,000 Utah residents. This represents a 3.6% increase in the rate of people living with HIV from 2013 to 2017. There is no vaccine.

**HIV IS A BURDEN FOR LABORATORIES.** Patients with HIV get sick, a lot. That's the nature of this disease. So, they have a higher laboratory profile than healthy people. So, we see a higher proportion of HIV positive samples in our work than is reflected in the population. That's math and why it matters to us that HIV gets attention; we're at risk.

**BIOSAFETY IS FAILING HIV.** {Okay, guys, full disclosure. Laboratories use engineering controls with success. Sharps awareness, the BBP standard, and PPE in the lab make LAI a rare event.} We could be doing so much better with HIV than we are but for a couple things, money and ignorance. The *Biosafety Hierarchy of Controls* is meant to protect people from threats like HIV. Here's why it doesn't; Pharma is putting profit ahead of prevention and States (like ours) are putting image ahead if impact.

Let me explain? This fulfills my obligation as Biosafety Officer doing my biosafety outreach; and it gives me an opportunity to rant. Here's the Hierarchy (most effective to least):



**Elimination (#1).** Well, we can't just get rid of it until we have vaccine and a program like Smallpox and Polio that encompasses the world. Too bad.

**Substitution (#2).** In a research lab, this one makes sense. Just use a modified, or safer strain. Again, not an option, damnit.

**Engineering Controls (#3).** Ahh, now we're talking. Oh, wait, money talks (and that is the problem). While there is no vaccine, yet, **there are drug therapies that are effective.** Treatment as prevention (TasP) Pre-exposure prophylaxis (PrEP) and Post-exposure prophylaxis (PEP) all are proven to reduce disease 99%. Studies monitored thousands of male-female and male-male couples in which one partner has HIV and the other does not over several years. No HIV transmissions were observed when the HIV-positive partner was virally suppressed. If you keep your viral load "undetectable", there is effectively no risk of transmitting HIV to someone you have sex with. Sounds easy, right?

Gilead is the company that controls the drug in the US and they are extorting Americans for HIV prevention (I've slammed these guys before and their litigation is on the record). Gilead charges \$20,000/yr. for its Truvada drug therapy. The same formula is available around the world for \$60. A million citizens at risk could use this drug (oh, they have another, better drug available and are just waiting until profit from Truvada is maximized before starting a new extortion) and only a handful can afford it or use it.

**Administrative Controls (#4).** Here's where the clear response effort gets murky. We shout about HIV from the rooftops of the CDC and our health departments and the voices get carried away in the winds of indifference, apathy, and denial. We talk a good game, but incidence continues to climb. In Utah, the highest population with disease is older (45-54) but the fastest growing is the younger adults (25-34). We can do better at making the issue heard.

**PERSONAL PROTECTIVE EQUIPMENT (#5).** Least effective, PPE is a biosafety control of last resort. For you and me, PPE is mandated because we understand that risk is everywhere and we mitigate that risk first with our Engineering Controls (sharps, etc.), then, Administrative Controls (SOPs, BBP std., etc.), and then, lastly, PPE.

Outside the lab, another form of PPE has been shown to be highly effective in HIV prevention. **Condoms**, when used correctly and consistently, are highly effective in preventing HIV and other sexually transmitted infections (STIs). The body of scientific evidence shows that male latex condoms have an 80% or greater protective effect against the sexual transmission of HIV and other STIs.

(If you stayed with me this far, congratulations, you've come to the whole point of this newsletter)

Condom distributions are an Engineering Control with huge Administrative Control support that provide Personal Protective Equipment biosafety. They're just stigmatized. And that's where it all falls apart.



Utah has just shut down a large condom distribution and awareness campaign **Because The Governor Didn't Like the Package.**

Federal funding was utilized by the State DOH to develop a program for distribution of condoms to prevent disease. A lot of time and resource went into a campaign to make prevention awareness and practices available to our citizens. Governor Herbert disagreed with the messaging and pulled the plug. They [shut down the website](#) that went along with the campaign. That's kicking three legs of the biosafety strategy out from under the problem.

Look, we don't stigmatize, make fun of, or ignore the importance of gloves, lab coats, eye protection, single-use needles, sharps containers, blood and organ testing and all the information about HIV prevention. We should be able to use every tool in the toolbox to protect people from a preventable disease.

STI diseases can be prevented. Condom use and marketing efforts focus on the target population and not the administration. Good, caring health care workers dedicate their efforts in trying to provide the best ideas for prevention. Federal funds under Ryan White Part B are shared by states and gone after distribution. We've thrown away some good biosafety.

Have a great week and be safe,

Bryan

