

Compared to other health conditions, HIV has a relatively short history. In order to gain insights on what may lie ahead for HIV care delivery, we examined the evolution of two examples (or "analogs") that have longer histories: diabetes and contraception.

### HOW OUR ANALOGS ANALYSIS WORKS







Apply the lessons

learned from each

target problem to

gain new insights

and solutions

analog to the

Identify key of the targe problem

Identify a set of analog problems that have simila characteristic

Research each analog, focusing on understanding the analog's history and keystone moments

### **OUR SOURCES FOR THIS RESEARCH**



### & CADEMIC & **POPULAR PRESS**

Historical accounts, analysis of the current status, and future looking articles written both for researchers and a lay audience.



### PROFESSIONAL ORGANIZATIONS

Reports and analyses published by organization devoted to diabetes and contraception such as the American Diabetes Association and the Guttmacher Institute.



### GOVERNMENT RESOURCES

Analytic reports published by the CDC, and a database of contraceptive products in the FDA pipeline.

### DIABETES AS AN ANALOG TO HIV

- + Initially a death sentence, diabetes is now a managed chronic
- Managed by a daily medication
- Medication adherence and monitoring via blood testing is key.
- F Technological advancements have played a key role in the delivery of
- Diabetes requires much more intense monitoring than HIV (eg: at least 4 times/day)
- It is not an infectious disease.
- Type I is inherited and largely agnostic to social economic status.

### DIABETES TIMELINE

CONTRACEPTION TIMELINE

### CONTRACEPTION AS AN ANALOG

- + Contraception has a long history of stigma and access issues because of its association with sex.
- Historically delivered via daily pill. second wave contraception technology has made longer-acting options available.
- + The method of delivery impacts adherence and therefore effectiveness.
- Missing a dose increases the chance of unplanned pregnancy, not life threatening illness.
- Taking daily birth control is not a reminder of illness, as with ART.

Insulin was discovered, derived from animals (dogs and rabbits).

1921



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- 1 Over time, diabetes care has shifted (a) to the individual and (b) out of the clinic. This was enabled by the advent of at home testing, and patient support programs/systems (known in diabetes care as Diabetes Self-Management Education/Support or DSME/S)
- Insulin prices have skyrocketed: by 2016, the average price of insulin rose to \$450/month, resulting in a quarter of diabetes patients skimping on doses. This occurred for two main reasons:
- **A** Newer and more expensive human insulin analogs are more effective, particularly for individuals with allergies, and require simpler dosing regimens.
- **B** Doctors in the US stopped prescribing any of the older animal-derived insulins, so they were pulled from the US market, leaving only the higher priced human-derived products.

## INSIGHTS FOR THE FUTURE OF HIV CARE

If HIV follows the path of diabetes, care and treatment will move from the clinic to the home, putting more onus on the individual patient and reducing the burden on the clinic.

In order to facilitate a successful shift, HIV patients will need a patient support system similar to DSME and availability of accurate home testing.





### Insulin pricing serves as a warning indicator for HIV.

Despite immediate and life-threatening consequences, research has shown that patients ration insulin (i.e.: they underdose) due to cost pressure. If this were to happen with ART, the consequences would be magnified by an increased likelihood of transmission.

Longer acting ART (such as a subcutaneous implant) may improve adherence and alleviate the psychological burden of taking a daily pill that reminds a person that s/he is ill.

One of the hurdles with adoption of long acting contraception was lack of knowledge by providers.



## Longer acting ART and the potential for at home testing will necessitate a change in the role of the clinic.

When a patient no longer needs to come in for regular testing or prescription refills, the clinic will function more as a primary care provider and specialist consult.

### FINDINGS

- 1 The first wave of contraceptive research resulted in a highly effective daily pill that was refined to reduce dosing and potential side-effects.
- 2 The second wave of contraceptive research focused on developing alternative delivery methods that were longer acting. These methods last for years (varying from 2-10) and require no regular action on the part of the user to be effective.
- 3 Over the past 10 years, usage of longer lasting contraceptions has increased, while other methods have remained stable. When given the choice, patients seem to prefer longer-acting methods, and drug companies are paying attention: over 50% of contraceptives now in development with the FDA are long acting.

# We relied on a number of sources for this analysis. A complete list is contained within a separate, annotated bibliography. However, a few sources were key to this research:

#### Diabetes references

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