Fort Riley Department of Public Health

- Health of soldiers, family/beneficiaries, retired military, civilian employees, and surrounding community
- Industrial Hygiene
- Occupational Health
- Army Hearing Program
- Environmental Health
- Veterinary Services
- Public Health Nursing
Field Experience

- Rotations through each branch of the FRDPH
  - Industrial Hygiene
    - Noise measurements, air sampling, ventilation tests, ergonomics evaluations, mold inspections
  - Occupational Health
    - Overview of responsibilities, eye exam, vision screening, spirometry
  - Army Hearing Program
    - Hearing tests, hearing conservation, observed training lecture for hearing conservation officers
Field Experience, continued

- Environmental Health
  - Water sampling, learn about water system, membrane filtration tests, waste management inspection, child development center inspection, food service inspections
  - Vector surveillance, mosquitos and ticks
- Veterinary Services
  - Routine exams, tour of the facility, overview of services, commissary inspection, overview of MRE inspection
- Public Health Nursing
  - Overview of duties, TB screening clinic
Tuberculosis Screening Clinic

- Identification of positive TB case in JC school
  - FRDPH confirmed with KDHE and obtained list of contacts
  - Phone calls to beneficiaries on the list

- Screening questionnaire and intradermal TST
  - 159 students contacted. 130 beneficiaries.
  - 124 successfully contacted. 58 required testing. 7 referred out.

- In the end, 29 patients were screened and tested, three of whom were treated for TB.
Lessons Learned

- Importance of rapid response to a positive test
- Importance of having good working relationships and open communication with local health departments.
- Reinforced the importance of expressing sympathy and understanding for the patient.
Tuberculosis

- *Mycobacterium tuberculosis*
- WHO: TB is the number one cause of death or disability in people between the ages of 15 and 59 in the world
- Symptoms: significant rapid weight loss, persistent severe cough, fever
- Most individuals who become infected will have no symptoms, and the disease will be contained by the immune system
- In immunocompromised or very young patients, active primary disease may occur
- Latent TB can develop into active TB years after infection due to advanced age, or a weakened immune system
Tuberculin Testing

- Patients are considered for TB testing if they:
  - Are suspected to be a positive TB patient,
  - Have an elevated risk of having been exposed,
  - Have an elevated risk of developing active TB, or
  - Are regularly exposed to vulnerable, or high-risk populations.

- There are two main types of TB tests
  - Tuberculin skin test (TST)
  - Interferon-gamma (IFN-gamma) blood test
Tuberculin Skin Test

- Predominate TB testing method in the United States
  - Purified protein derivative (PPD): *Mycobacterium tuberculosis*
  - Intradermal administration

- Interpretation of a positive result is still debated

- Can produce a false positive if:
  - Exposed to another *Mycobacterium* species
  - Previously administered BCG vaccination

- Can produce false negative if:
  - Patient’s immune system is unable to respond to the challenge
  - Patient has been infected within 6 weeks prior to testing

- Relies on delayed hypersensitivity reaction

- Positive: raised induration 24 to 72 hours after administration
Interferon-gamma

- PPD is added to whole blood and incubated overnight

- Benefits over TST
  - Only requires one doctors visit to perform
  - Results not as vulnerable to interpretation bias

- Negatives of IFN-gamma
  - Requires a blood draw
  - Must arrive at laboratory within 12 hours of collection
  - Both require specially trained personnel and equipment

- Both are subject to interpretation complications, such as level of risk of the patient having been exposed to TB.
Tuberculosis Vaccine

- Bacilli Calmette-Guerin vaccine
- Not commonly used in the United States
  - Up to 80 percent vaccination in endemic countries
- Does not prevent latent TB patients from developing to active TB
- Made from attenuated *Mycobacterium bovis* that contains both living and dead bacteria
  - Can produce a false-positive
  - Vaccination history should not be considered when interpreting a TST result
Field Experience Project

- 19 million new STD infections arise each year in the US
  - $17 billion in medical care costs
  - Estimated that half of these cases are in individuals between 15 and 25 years of age

- If treated early on, many STDs can be cured without long term consequences
  - Some STDs do not always present with symptoms
  - Long term infection can lead to serious consequences

- Chlamydia is the most common STD diagnosed in the US
Chlamydia

- The most commonly diagnosed bacterial STD and the most costly STD in terms of medical costs
- Caused by *Chlamydia trachomatis*
- Symptoms: cervicitis, proctitis, urethritis in men and women
- Spread during oral, anal, or vaginal sex
- Untreated: pelvic inflammatory disease, ectopic pregnancy, infertility in women
- Testing: urine sample, vaginal swab, urethral swab in men, or sample collection from exposure site
- Treatment: one time oral dosing of 1g azithromycin, or twice per day 100mg doses of doxycycline for 7 days
- Since asymptomatic infection is common, screening is especially important
Gonorrhea

- The second most commonly diagnosed STD
- Caused by *Neisseria gonorrhoeae*
- Symptoms:
  - Men: symptoms typically send patients to seek testing before complications can develop
  - Women: symptoms not usually noticed until complications develop
- Co-infection with chlamydia is common
- Testing:
  - Men with symptoms: a gram stain of a urethral swab is sufficient for diagnosis
  - All other infections: urine sample (men and women), vaginal or endocervical swab, or urethral swab (men)
  - Samples should be cultured and used in a nucleic acid hybridization test
- Treatment: single 250mg IM injection of ceftriaxone
- Antimicrobial resistant strains are increasingly common in the US and around the world
Syphilis

- Caused by *Treponema pallidum*

- Has many manifestations:
  - Primary infection: ulcers or chancre
  - Secondary infection: skin rash, lymphadenopathy, mucocunaneous lesions
  - Neurosyphilis: cranial nerve dysfunction, meningitis, auditory or ophthalmic abnormalities, etc.
  - Tertiary infection: cardiac or gummatous lesions
  - Latent syphilis: patient tests positive on serologic test, but presents with no other signs or symptoms

- Presumptive diagnosis: non treponemal test (RPR, VDRL), or treponemal test
  - Confirmation requires more than one type of serologic test
  - Early syphilis can be diagnosed using lesion exudate, or darkfield test

- Treatment: single IM dose of Benzathine penicillin G, 2.4 million units
  - Retreatment: three weekly administrations
HIV/AIDS

- HIV is one of the lifelong STD infections, and therefore one of the most costly
- Over time it develops into AIDS
- Destroys T-cells and CD-4 cells, effectively killing the immune system
- HIV is most contagious during the early phase
- The CDC recommends that all patients seeking STD testing be tested for HIV
  - 2006: only 40 percent of adults had ever been tested for HIV
    - Only 25 percent of at-risk adults had been tested for HIV in the past year
- Following a positive HIV test, patients should be tested for all curable STDs, TB, including a chest x-ray, and HIV genotyping
STDs in Kansas: Chlamydia

Females had much higher reported rates of chlamydia than men.

Over the 2004 to 2014 time period, Chlamydia rates in Kansas have been steadily increasing from 274 infections per 100,000 population in 2004, to 380.5 per 100,000 in 2014.

Age range 20-24 is the most frequent, followed by age range 15-19.

African Americans have the highest reported rates of Chlamydia.

STDs in Kansas: Gonorrhea

Age range 20-24 is the most frequent, followed by age range 15-19 by an increasingly small margin from 2004 to 2012. The 25-29 age range was the second most commonly reported age range from 2013 and 2014.

African Americans have the highest reported rates of Chlamydia.

Females had higher reported rates than males.

Gonorrhea rates are at their all time lows, but have been increasing slightly over the past few years.

STDs in Kansas: Syphilis

Males had higher reported rates than females

Infection rates have been increasing over the 2004 to 2014 time period, with a decrease in 2010 to 2012.

The 20-24 age range has had the highest reported rates in recent years, with the 25-29 age range close behind.

African Americans have the highest reported rates, with a spike in numbers in the past few years.

# STDs in Kansas: HIV/AIDS

<table>
<thead>
<tr>
<th>Risk Factors</th>
<th>Cumulative HIV Cases</th>
<th>Cumulative AIDS Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>78.7%</td>
<td>74.2%</td>
</tr>
<tr>
<td>Black Non-Hispanic</td>
<td>49.2%</td>
<td>30.6%</td>
</tr>
<tr>
<td>White Non-Hispanic</td>
<td>44.3%</td>
<td>58.1%</td>
</tr>
<tr>
<td>Age Range(s)</td>
<td>25-34 (36.1%), 15-24 (31.1%)</td>
<td>35-44 (43.5%), 25-34 (29.0%)</td>
</tr>
<tr>
<td>Men who have sex with men</td>
<td>49.2%</td>
<td>48.4%</td>
</tr>
</tbody>
</table>

[Link to the document](http://www.kdheks.gov/sti_hiv/update_newsletter/2012_Annual_Tables.pdf)
Methods

- In collaboration with Dr. Benne and Major Lindsey at the Fort Riley Department of Public Health, a 34 question survey was developed and sent out to prominent health clinics in Riley and Geary counties.

- Purpose:
  - Assess the clinic’s process for screening, testing, and treatment for a patient wanting to be tested for STDs
  - Identify barriers to treatment, or areas that may be adapted to increase testing and treatment, and STD rates

- Covered basics such as clinic hours, scheduling, and insurance

- Also, screening policies, testing methodology, treatments used, education, and community partnerships/outreach

- Clinics Surveyed:
  - 1: Riley Country Health Department
  - 2: Lafene Student Health Center
  - 3: Geary County Health Department
  - 4: K-Stat Urgent Care
  - 5: Konza Prairie Community Health Clinic
  - 6: Junction City Youth Clinic
  - 7: Irwin Army Community Hospital Emergency Room
## Results

<table>
<thead>
<tr>
<th>Clinic</th>
<th>Hours of Operation</th>
<th>Weekend Hours</th>
<th>Walk-Ins</th>
<th>Same-day Appointments for STD Testing</th>
<th>Sexual Health Education/Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Riley County Health Department</td>
<td>MTW 8-4:30</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Lafene Student Health Center</td>
<td>M0Th 8-6, F 8-5, Sat 10-1</td>
<td>Yes, limited services</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Geary County Health Department</td>
<td>M-Th 8-4, F 8-2</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>K-Stat Urgent Care</td>
<td>M-Sat 9-8 Sun 10-6</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Konza Prairie Community Clinic</td>
<td>M 8-6, T 9-5:30, WTH 8-5:30, F 8-12</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Junction City Youth Clinic</td>
<td>M-Th 8-5 F 8-3</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>IACH ER</td>
<td>----</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Clinic</td>
<td>Monogamy or Abstinence</td>
<td>Safe Sex Methods</td>
<td>Provide Condoms</td>
<td>Interventions (Group or Individual)</td>
<td></td>
</tr>
<tr>
<td>------------------------------</td>
<td>------------------------</td>
<td>------------------</td>
<td>-----------------</td>
<td>-----------------------------------</td>
<td></td>
</tr>
<tr>
<td>Riley County Health Department</td>
<td>Upon invitation</td>
<td>Upon invitation</td>
<td>Yes, male, female, dental dams</td>
<td>Yes, part of patient history</td>
<td></td>
</tr>
<tr>
<td>Lafene Student Health Center</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes, free of charge</td>
<td>No response</td>
<td></td>
</tr>
<tr>
<td>Geary County Health Department</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes, male condoms</td>
<td>Yes, individual</td>
<td></td>
</tr>
<tr>
<td>K-Stat Urgent Care</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Konza Prairie Community Clinic</td>
<td>No response</td>
<td>No response</td>
<td>Yes</td>
<td>No response</td>
<td></td>
</tr>
<tr>
<td>Junction City Youth Clinic</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes, male, female, flavored, dental dams</td>
<td>Yes, individual or group, by request</td>
<td></td>
</tr>
<tr>
<td>IACH ER</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Clinic</td>
<td>Services Provided*</td>
<td>Testing Methodology†</td>
<td>Labs Run In-House</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------------------------</td>
<td>--------------------</td>
<td>----------------------</td>
<td>----------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Riley County Health Department</td>
<td>All services</td>
<td>Chlamydia, gonorrhea, HIV, syphilis</td>
<td>All labs sent to KDHE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lafene Student Health Center</td>
<td>All services</td>
<td>Chlamydia, gonorrhea, HIV, syphilis</td>
<td>Chlamydia, gonorrhea, rapid HIV, RPR (syphilis)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Geary County Health Department</td>
<td>All services</td>
<td>Chlamydia, gonorrhea, syphilis</td>
<td>All labs sent to KDHE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K-Stat Urgent Care</td>
<td>STD testing only</td>
<td>Chlamydia, gonorrhea, HIV, syphilis</td>
<td>No labs run in-house</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Konza Prairie Community Clinic</td>
<td>All services</td>
<td>Based on patient symptoms</td>
<td>Hepatitis C, HIV, trichomoniasis, bacterial vaginosis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Junction City Youth Clinic</td>
<td>STD testing, family planning</td>
<td>Chlamydia, gonorrhea, HIV, syphilis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IACH ER</td>
<td>Emergency only</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Services listed on survey: Well Woman exams, pap smears, breast exam, family planning, emergency contraception, pregnancy. No clinic surveyed provided abortion services.

† Testing methodology describes the tests the clinic encourages for all patients seeking STD testing. Actual tests performed are dependent on the patient.
Chlamydia, gonorrhea, syphilis, HIV, and AIDS are all reportable diseases in Kansas.

For labs run in-house, positive results are reported to the state by the clinic.

For labs sent out, the laboratory reports to the state.

Barriers to Reporting:
- Reporting takes time
- HIPAA and secondary server for encryption complicates reporting
- Some patients do not provide sufficient information to report a positive result
Notification and Contact Tracing

- Clinics are notified of lab results electronically or via mail
- Riley County Health Department has representatives from KDHE and Konza Prairie Community Clinic on site for collaboration on contact tracing
  - Geary County Health Department, K-Stat Urgent Care, and IACH: do not participate in contact tracing
  - Konza Prairie Community Clinic: maintain open communication with other clinics
  - Junction City Youth Clinic: try to perform contact tracing on their own, but if the case is complicated, it is referred to KDHE
- The most common method to alert a patient to their results is via phone call. Some clinics have the patient schedule an appointment to receive test results.
  - Most clinics also inform patients of negative test results
Partner Testing and Follow-Up Labs

- All of the clinics provide partner treatment based on positive results of the index patient
  - All clinics except for IACH require that the partner be seen by a provider prior to receiving treatment. These clinics provide same-day treatment, but also require partner testing.
  - Junction City Youth Clinic: requires directly observed treatment

- Follow-Up Labs
  - K-Stat: for positive results
  - IACH: upon doctor request only
  - Riley County Health Department: follows CDC guidelines
All clinics surveyed have a mixed waiting room.

At clinics where appointments are available, the reason behind the visit is not asked upon check in.
  - Riley and Geary County Health Departments, K-Stat Urgent Care, and IACH, reason for the visit is asked upon check in.

All clinics surveyed reported using CDC guidelines when prescribing drug treatments.

All clinics had standing orders for treatment, or the provider had the leeway to decide how to treatment administration based only on symptoms, or risk factors.

Standardization of Care:
  - Junction City Youth Clinic: providers are trained to ask the same questions of each patient.
  - Geary County Health Department follows CDC and KDHE guidelines.

<table>
<thead>
<tr>
<th>Clinic</th>
<th>Costs</th>
<th>Immunization Inquiry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Riley County Health Department</td>
<td>Sliding scale fees, do not require payment at time of service</td>
<td>Hepatitis B, HPV</td>
</tr>
<tr>
<td>Lafene Student Health Center</td>
<td>Cost per test run</td>
<td>No response</td>
</tr>
<tr>
<td>Geary County Health Department</td>
<td>STD testing $25.00 flat fee</td>
<td>No</td>
</tr>
<tr>
<td>K-Stat Urgent Care</td>
<td>Cost per test run</td>
<td>Hepatitis B</td>
</tr>
<tr>
<td>Konza Prairie Community Clinic</td>
<td>STD testing $30.00 flat fee</td>
<td></td>
</tr>
<tr>
<td>Junction City Youth Clinic</td>
<td>Cost per test run</td>
<td></td>
</tr>
<tr>
<td>IACH ER</td>
<td>----</td>
<td>Can look up records</td>
</tr>
</tbody>
</table>
## Insurance

<table>
<thead>
<tr>
<th>Clinic</th>
<th>Blue Cross/Blue Shield</th>
<th>Medicare/Medicaid</th>
<th>Tricare</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Riley County Health Department</td>
<td>-----</td>
<td>Member provider</td>
<td>Member Provider</td>
<td>Aetna, accept all other insurances*</td>
</tr>
<tr>
<td>Lafene Student Health Center</td>
<td>Yes</td>
<td>Not accepted</td>
<td>No</td>
<td>Submit claims for all other insurances</td>
</tr>
<tr>
<td>Geary County Health Department</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>-----</td>
</tr>
<tr>
<td>K-Stat Urgent Care</td>
<td>-----</td>
<td>Medicaid – Yes</td>
<td>Yes</td>
<td>-----</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Medicare – No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Konza Prairie Community Clinic</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Accept all insurances</td>
</tr>
<tr>
<td>Junction City Youth Clinic</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>-----</td>
</tr>
<tr>
<td>IACH ER</td>
<td>-----</td>
<td>No</td>
<td>Yes</td>
<td>-----</td>
</tr>
</tbody>
</table>

*Accepts all insurances, but are not member providers for all insurances.
## Populations Served

<table>
<thead>
<tr>
<th>Clinic</th>
<th>Age</th>
<th>Gender</th>
<th>Population Served</th>
</tr>
</thead>
<tbody>
<tr>
<td>Riley County Health Department</td>
<td>All ages (20-mid30 yo mostly)</td>
<td>Male and Female</td>
<td>No response</td>
</tr>
<tr>
<td>Lafene Student Health Center</td>
<td>Mostly 18-30 yo</td>
<td>Male, Female, Transgender</td>
<td>No response, KSU students and spouses</td>
</tr>
<tr>
<td>Geary County Health Department</td>
<td>14-65 yo</td>
<td>Male and Female</td>
<td>~15,000/year, general public</td>
</tr>
<tr>
<td>K-Stat Urgent Care</td>
<td>All ages</td>
<td>Male and Female</td>
<td>~15,000/year, general public</td>
</tr>
<tr>
<td>Konza Prairie Community Clinic</td>
<td>14-100 yo</td>
<td>Male and Female</td>
<td>No response</td>
</tr>
<tr>
<td>Junction City Youth Clinic</td>
<td>&lt; 21 yo</td>
<td>Male and Female</td>
<td>No response</td>
</tr>
<tr>
<td>IACH ER</td>
<td>All ages</td>
<td>Male and Female</td>
<td>33,000/year, ~100/day</td>
</tr>
</tbody>
</table>
Discussion

- Results show that there are many strong points in the health clinics surveyed, but also areas for that can be improved upon with the goal of reducing STD rates in the population, including diminishing barriers to testing and treatment.

- According to the CDC, a solid STD prevention and control system is built around 5 tenets:
  - 1. Education and counseling for at-risk individuals,
  - 2. Recognition of asymptomatic patients and symptomatic patients who may not seek care,
  - 3. Diagnosis, treatment, and counseling for patients,
  - 4. Partner services and care, and
  - 5. Preventative vaccination for at-risk individuals.
Recommendations

- **Subpopulations**
  - Manhattan population: 52,281, 30% 20-24 year olds, 10% 25-29 year olds
  - KSU: 24,766 students enrolled in 2014
  - Fort Riley population: 20,498, 35+% 20-29 year olds
  - In contrast, less than 15% of the population of Kansas falls into the 20-29 year old age range

- **Cost and Availability**
  - Ensure clinics offer hours of operation that are convenient for the varied schedules of college students in Riley County
  - Offer low costs for STD testing and treatment
- **Counseling**
  - Incorporate individual level intervention and education at every medical appointment
  - Offer group counseling opportunities to high-risk patients

- **Screening and Testing**
  - Follow CDC guidelines on screening and testing sexually active individuals
    - Sexually active women 25 years or younger

- **Retesting**
  - Retest positive chlamydia, gonorrhea, and syphilis patients 3 months after treatment to check for reinfection
  - HIV testing at time of initial treatment for syphilis
- **Partner Management**
  - Have the index patient bring their partner with them for their next appointment
  - Utilize patient delivered partner therapy and expedited partner therapy

- **Reporting**
  - Send labs to KDHE, and allow them to handle reporting
  - Make electronic reporting available to clinics

- **Testing Methodology**
  - Whenever possible, use the least invasive or uncomfortable testing method
  - Use the treatment method that will guarantee the best patient compliance
Project Critique

- Although this data for this report was obtained from only 7 clinics, each clinic is prominent in their community, and they represent a variety of available health care options.

- Interviews could have been more detailed and thorough if they had been performed in person, or over the phone, rather than dropping them off at the clinics.
Core Courses and Area of Emphasis Courses

- Social and Behavioral Sciences: look at a health issue from its many facets – provider, patient mentality, societal stigmas, etc.

- Health Services Administration: directly applied to my field experience project, many departments and individuals who contribute to a well functioning clinic.

- Biostatistics: interpret data during rotations and research, provided a more critical eye for judging data and reports.

- Environmental Health Sciences and Toxins in Biological Systems: Environmental Health and Industrial Hygiene rotations.

- Epidemiology: useful throughout my rotations and research, taught me to compare disease rates in populations, look for causes or results on a population level, interpret disease spread.

- Multidisciplinary Thought and Presentation: gave me more experience with writing and presenting in a professional setting.

- Pathogenic Mechanisms: more in depth understanding of how diseases may be spread, controlled, and treated depending on their abilities.
Acknowledgements

- Dr. Paul Benne
- Major Lindsey
- Fort Riley Department of Public Health Staff
- Dr. Roman Ganta
- Dr. Justin Kastner
- Dr. Sanjeev Narayanan
Questions?