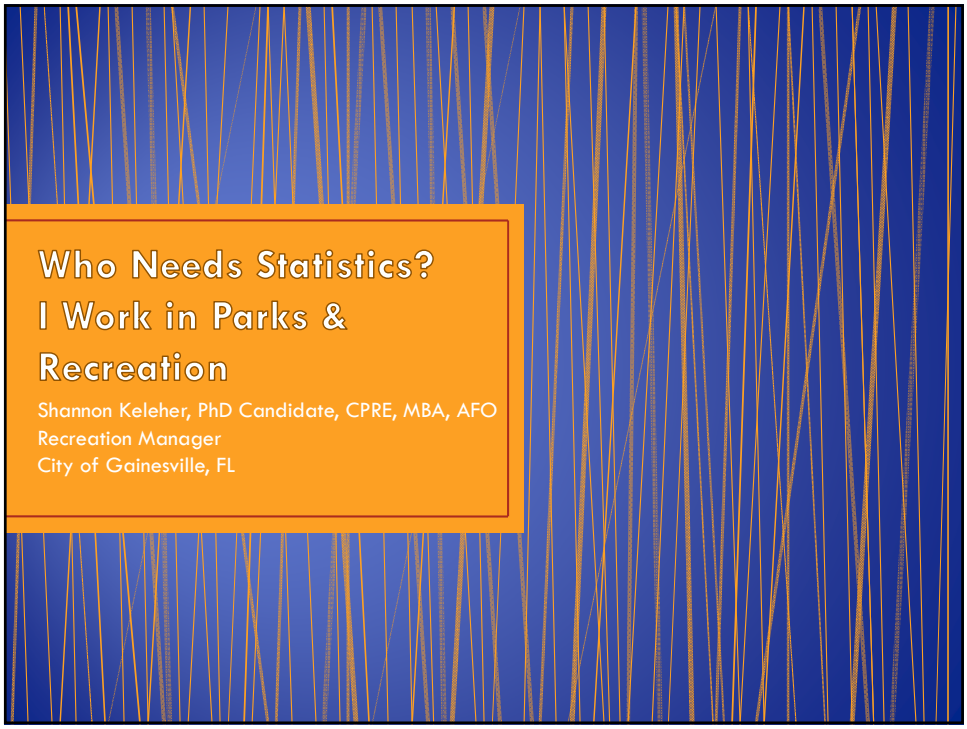


Session Objectives

- At the end of this session you should be able to:
  - Identify the general approaches to and issues with public sector research and data measurement.
  - Review basic statistic definitions and techniques.
  - Explore where to find available data and techniques for utilizing it.

Imagine…

$50,000

Parks and Recreation…

The Fire Department…

- Current Average response time is 4 minutes
  - Proven through data collection and analysis
- With the additional $50,000
  - Can reduce response time to 3 minutes 30 seconds…Thereby saving approximately 25 more houses per year based on our service area.

STORYTELLING

VS.

STATISTICS

Parks and Recreation…Again

- Active involvement in our summer camp program has resulted in a 43% increase in the number of children who have learned how to swim.
- All children attending summer camp receive "free" swim lessons.
- 250 current available (funded) camp openings exist.
- With an additional $50,000 we can increase that number to 500.
- Let me tell you about Jen…

Session Outline

1. Why Do We Need Statistics?
2. What Does "Research" Mean?
3. Basic Use of Numbers by Definition
4. Basic Data Interpretation

Why do We Need Statistics?

- Many "good" people make decisions thoughtfully and with good intentions BUT with little or no information to guide them.
  - It sounds like a good idea…
  - Everyone else is supporting it…
    - Ex: a new senior center
- Information, data, is needed to make better decisions

WHAT? – SO WHAT? – NOW WHAT?

Statistics…

- Statistics is a language that requires a translator
- Public employees should be able to speak this language and to translate to groups such as:
  - Local Government Managers
  - The City Council
  - A Board of Trustees
  - A Department Head
  - The General Public
- Benefits of learning the language:
  - Opportunities for funding – grants, donations, etc.
  - "Real" data to survive budget cuts

https://stat.cityofgainesville.org/

What Does "Research" Mean?

- An issue has come up and you have to answer a question…
  - Garbage In – Garbage Out
- Steps for Research Design:
  1. Understand the issue
  2. Identify the problem
  3. Explain your theory
  4. Formulate the research question
  5. Formulate the hypothesis
  6. Operationalize the hypothesis
  7. Select the methodology
  8. Evaluate the data

1. Understand the Issue

- Ask yourself, "What is the issue?"
  - In order to collect any data to help solve a problem you must first understand the issue at hand such as:
    - The Population
    - The Services It Needs
    - Upcoming Elections
    - Sensitive Political Situations
    - Ethics
    - Zoning Controversies
    - Etc.

2. Identify the Problem

- Ask yourself, "What is the issue?"
- Have you ever met someone who has plenty of solutions and is just looking for a problem?
- A well-written problem statement is clear and specific.
  - The number of bicycle accidents has increased dramatically over the past 5 years OR
  - The public safety budget is already in the red six months from the end of the fiscal year.
- If you cannot clearly state what the problem is you cannot focus your research in a way that gets directly to the point.

3. Explain Your Theory

- Goal:
  - To explain your theory by outlining how different things or events relate to each other….Develop a MODEL.
- What's a model?
  - A diagram of how you think various actors, situations or indicators relate to each other.
  - Based on theory – no evidence or data collected yet.
    - Simple
    - Complex

A Simple Model

- Number of unsupervised children at home after school

- Level of minor crimes in a community

A More Complex Model

- Number of unsupervised children at home after school
- The local economy
- Number of after-school parks and recreation programs offered

- Level of minor crimes in a community

3. Explain Your Theory (cont).

- Every Model Will Be Different
  - We are searching for relationships, which requires 4 things:
    - Time Order
      - What happened first in our model? Poor economy or increase in crime?
    - Theoretical Support
      - Does the relationship make sense? Is it logical?
    - Co-variation
      - Positive Relationship
      - Negative/Inverse Relationship
    - Legitamacy
      - True vs. Spurrious Relationships
        - Popsicles and Murders During the Summer

4. Formulate the Research Question

- Identify what you need to know to test your theory
  - This is your General Research Question
    - Look for information NOT subjectivity
    - Do not ask questions such as, "Should the city do…?" OR "What is the best way to…?"

5. Formulate the Hypothesis

- Specifically identify what you need to know to test your theory
  - Create a hypothesis or multiple hypotheses
    - Nothing more than a hunch or a guess
  - Method
    - Problem
    - General Research Question
    - General Hypothesis
    - Operationalized Hypothesis (Step 6)
      - We will get to this in a minute…

Problem

- The number of minor crimes has increased over the past year.

General Research Question (WHY?)

- Why has the number of crimes increased?

General Research Question (WHY?)

- Why has the number of crimes increased?

General Hypothesis

- There are not enough community activities offered for kids after school.

6. Operationalize the Hypothesis

- Identify exactly what you need to know to test your theory
  - Operationalize – take something abstract and put into concrete, measureable terms
    - Goal is that it is falsifiable
      - Want to be able to disprove it
      - Hypothesis: Life exists on other planets VS.
      - Hypothesis: There is some form of life as we know it on Mars

General Hypothesis

- There are not enough community activities offered for kids after school.

Operational Hypothesis (Step 6)

- The number of community activities offered to children after school has decreased in the past three years OR
- The majority of parents report that they have no options for after-school activities for their children.

7. Select the Methodology

- Figure out how to gather your information
  - Methods used determine quality of overall research
  - Research Design Types
    - Experimental (best)
      - Both a control and randomization
    - Quasi-experimental (okay)
      - Either a control or randomization
    - Nonexperimental (will work when needed)
      - Neither a control nor randomization
  - Research Quality
    - As administrators nonexperimental designs are used most
    - Research must be reliable (can it be replicated?) and valid (is it measuring what we want it to measure?)

8. Evaluate the Data

- Decide if the data you gather are good enough to answer your questions, inform your decision, and help you solve your problem.
  - Reliability – Are the data measured consistently so they can be replicated?
    - Ex: Stopwatch
  - Validity – Does our data really measure what we want them to measure?
    - Similar concept to accuracy
    - Be careful your data aren't skewed or mismeasured
      - Ex: UNC
      - Ex: Fire Station Performance

Your turn…

- Think about an issue you are currently facing or an issue in your community.
- Work with a partner (or partners) around you to create a research design to research the issue at hand.

Descriptive Statistics

- Data is not just numbers – Some are numbers; some are not
- Data collected is referred to as observations
  - The differences from observation to observation is called a variable
  - Variation makes statistics possible. We are seeking patterns.
- Types of data:
  - Nominal (Data made up of named things – categorical)
  - Ordinal (Also named BUT we can order them)
  - Interval (Numerical with equal intervals between values – Very Precise)
    - The best analyses include all three types

More Descriptive Statistics

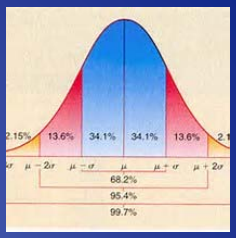
- Counts (or frequency) distributions are always the first step
  - Look at the data…
- Outliers
- Smoothing Data
  - Use trend lines to eliminate spikes and valleys in pictures
- Measures of Central Tendency
  - Mean (if higher than median there is an outlier)
  - Median (often used; not skewed by outliers)
  - Mode (if different from mean and median there is a skew)

Even More Descriptive Statistics

- Data distribution (small to large or large to small)
  - Organize to show a snapshot
  - Frequencies and Percentages

# inspections	Frequency Distribution (# of weeks)	Percentage Distribution (% of total weeks)
0-10	3	5.7
11-20	5	9.6
21-30	7	13.5
31-40	7	13.5
41-50	4	7.7
51-60	2	3.9
61-70	6	11.5

Even More Descriptive Statistics



- Standard Deviation:
  - Shows how spread out the data are
  - Must be used with the mean or median; it means nothing by itself
  - How we understand whether our data are unusual
- Normal Curves
  - If you know the mean and standard deviation of a data set, you can find out where any value is.
  - z-score: the # of standard deviations a particular point is away from the mean in a data set.
    - equals where point is relative to data set

Inferential Statistics

- We are trying to infer something about the broader world from a sample of the data.
  - Is the sample a good representation of the population?
- Likelihood – Probability – Chance
  - All mean the same thing
  - Anything can be random
    - Confidence…are there patterns in the data that are clear?
- Basic law of probability
  - Event = Outcome
  - # of ways a thing can happen/# of ways all possible things can happen

Sample Size

- Samples are portions of the population who we hope represent a larger group
- Because samples are estimates they all contain some error
  - Confidence Intervals are our margins of error
- The right sample size depends on three things:
  - Precision – More precision = larger sample
  - Confidence – Common cut-offs are 90%, 95%, 99%
  - Spread of the data
- Types of sampling:
  - Random (gold star)
  - Stratified (break your sample into groups and randomly sample from the groups)
    - Helps ensure equality across the entire group

Now What? Interpreting the Results

- Things to Look For:
  1. Is there a consistent pattern in the data?
  2. How strong is the pattern?
  3. Is there a relationship between the 2 variables?
  4. What kind of relationship is it and what kind of variables are they?
  5. Is it statistically significant?
  6. Does it really matter?

USING STATISTICS FOR PROGRAMS AND FUNDRAISING

HEATWAVE
Gainesville, FL

Protective Factors

…in the family, including having parents who demonstrate love and caring for their children, who are involved in their children's activities, and who monitor and supervise their children's behaviors. Adult supervision of and involvement in youth peer group activities, to provide added protection against developing delinquent behavior.

Other family-oriented protective factors include family stability and adequate financial resources.

Positive personal attributes such as social and conflict resolution skills (including the ability to solve problems without resorting to violence). Youth participation in, and acceptance by, prosocial peer groups. Peer influence is particularly important during adolescence.

Schools that positively shape behavior of young children and teenagers begins with teachers who care about students and demonstrate concern for their students' social and academic growth. Youth that attend school daily, on time, and are prepared for school, succeed in school, and are committed to the value of education, are less likely to become delinquents.

Communities that provide opportunities begins with exhibiting a high level of organization and cooperation, with neighbors working together to meet common objectives, channeling/engaging youth behavior toward constructive outcomes. For example, communities with afterschool recreational and tutoring activities and youth social clubs help to protect youth from the temptations and risks that exist in society.

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"…particularly when confronted with stressful or emotional decisions, teenagers are more likely to act impulsively, on instinct, without fully understanding or analyzing the consequences of their actions."

- Dr. David Fassler, a psychiatry professor at the University of Vermont College of Medicine

Experts say that even at ages 16 and 17, when compared to adults, juveniles on average are more:

- **impulsive.**
- **aggressive.**
- **emotionally volatile.**
- **likely to take risks.**
- **reactive to stress.**
- **vulnerable to peer pressure.**
- **prone to focus on and overestimate short-term payoffs and underplay longer-term consequences of what they do.**
- **likely to overlook alternative courses of action.**

Research doesn't absolve teens but offers some explanation for their behavior.

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All young people need
safe places to go,
worthwhile things to do,
a sense of belonging,
a sense of competence,
a feeling of hope,
and relationships with people
who can help
make a difference in their lives

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Year	# of Offenses/# of youth, Alachua County Only	Change in Offenses from Previous Year
2000	2373 cases	n/a
2008	1823 /1,239	-208
2009	1562 /1,046	-261
2010	1382 / 979	-180
2011	**1311 cases /836 youth** 616 youth were charged with only one offense, (74%)194 youth committed 2-4 offenses, (23%)26 youth committed 5 or more offenses (3%) 171 offenses	- 71
2012	**1208 cases /792 youth**	-103
*2013** *Jan 1-Aug 18*	***~690 cases / 475 youth*** *363 youth were charged with only one offense, (76%)* *99 youth committed 2-4 offenses, (21%)* *13 youth committed 5 or more offenses* *(3%….92 offenses)*	
2014* *Jan 1-Aug 16*	***733 cases/518 youth*** *399 youth charged with only 1 offense, (77%)* *105 youth committed 2-4 offenses, (20%)* *14 youth committed 5 or more offenses* *(2%...88 offenses)*	

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Month Juvenile Offense Occurred

	2014	2013	2012	2011	2010	2009	2008	2007
Jan	88	82	115	104	121	133	141	153
Feb	113	81	91	101	118	140	169	206
Mar	101	116	89	116	153	164	192	218
Apr	100	111	113	120	135	154	150	156
May	130	94	119	125	135	131	148	165
Jun	88	65	106	85	106	142	155	160
Jul	96	106**	82	105	125	130	139	166
Aug	*17**	*50**	***85***	**86**	**85**	**92**	**136**	153
Sep	*	*	121	137	109	141	161	201
Oct	*	*	95	120	107	134	152	217
Nov	*	*	106	102	98	99	153	121
Dec	*	*	86	110	90	102	127	115
Total	733*	705*	1,208	1,311	1,382	1,562	1,824	2,031

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2014* Types of crimes by Juveniles, by Charge

	Frequency	Percent
Affray	**26**	**3.5%**
Agg batt	**7**	**1%**
Alcohol	**7**	**1%**
Assault/ Agg ass	**23**	**3%**
Battery	**106**	**14.5**
Burg/att burg	47	6.4
combination	31	4%
crim mischief	19	2.6
disorderly conduct	30	4%
disr school Function	10	1.4
dom battery	**65**	**9%**
False ID	15	2%
G theft	49	6.7
Loiter	13	2%
Mari/Drug	**75**	**10.25**
Other	10	1.4
Petit theft	93	12.7
Robbery	**14**	**2%**
ROWV	36	5%
RWOV	13	2%
Sex/Lewd	**7**	**.1%**
Trespass	18	2.5

COED BASKETBALL

COED BASKETBALL

Come join our coed athletics program. Build character through fairness and respect for all players, regardless of skill.

2014 Dates: June 16 – August 8

Ages: 13 – 18 (18 if still in school. Age as of December 31, 2014.)

Play Times by Age: 13 –15 Tues. & Thurs., 2 – 9 pm, 16 –18 Mon. & Wed., 2 – 9 pm

Last game starts at 8 pm. Friday–Sunday are reserved for make-up games. No games July 4, and July 21 – 25.

There will be a single-elimination tournament at the end of the season.

Location: Martin Luther King Jr. Multipurpose Center, 1028 NE 14th Street

Teens must participate in two life skill classes a week.

- Life skill classes are mandatory in order to play. A list of life skill classes will be handed out at the start of HeatWave. Classes will consists of inspirational speakers, hands-on activities and light refreshments

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TEEN LOUNGE

- Need a safe place to hang out with your friends, play video games, ping-pong and bumper pool? New this year! Open Gym, Movie Nights, Video Tournaments and More! Show us what it means when Character Counts through trustworthiness and caring while having a good time.

2014 Dates & Times: June 16 – August 15, Mon. – Thurs.: 6 – 9 pm; Fri.: 2 – 9 pm, Open Gym on Fridays from 2– 6 pm.

Ages: 13 – 18 (18 if still in school. Age as of 12/31/2014.)

- Wristband required for entry into the center. Register on location at the center. Closed for the July 4 holiday.
- Martin Luther King Jr. Multipurpose Center, 1028 NE 14th Street

Transportation from other recreation centers will be provided.

- **Porters Community Center**, 512 SW 2nd Terrace
  Pick-up: 5:30 pm; Drop-off: 9:15 pm
- **Eastside Community Center**, 2841 E University Avenue
  Pick-up: 5:45 pm, Drop-off: 9:00 pm

Transportation will be arranged for **Northwood Villas Community Center.**
Pick-up and Drop-off times will be posted at the center, located at 2509 NW 57th Place.

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POOL PARTIES

Come join one of our pool parties this summer and celebrate good character, citizenship and responsibility while having a good time! Swim, dance, listen to music and enjoy a little food, hot off the grill! Operation Respect Yourself is a partnership between the Parks, Recreation and Cultural Affairs Department and the Gainesville Police Department. **Ages: 13 – 18.** (No registration required.)

2014 Dates & Time:	**Location:**
June 5, 3 – 7 pm	Andrew R. Mickle, Sr. Pool, 1717 SE 15th Street
July 18, 11:30 am – 4 pm	Dwight H. Hunter (Northeast) Pool, 1100 NE 14th Street
August 16, 11:30 am – 4 pm	H. Spurgeon Cherry (Westside) Pool, 1001 NW 31st Drive

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HW Participants:

- 126 13-15 year olds in Basketball
- 32 13-15 year olds in Teen Lounge

- 57 16-18 year olds in Basketball
- 8 16-18 year olds in Teen Lounge

Total: 223 youth

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Age	2014		2013	
6-9	4	.5%	9	1.7%
10	8	1%	11	1.6%
11	15	2%	9	1.3%
12	30	4%	63	9%
13	69	9%	64	9%
14	112	14%	98	14%
15	120	16%	135	19.5%
16	212	29%	156	22.6%
17	163	22%	145	21%
Total	733		690	

86% of ALL juvenile offenses in 2013 involved a youth between the ages of 13-18.

90% of ALL juvenile offenses in 2014 involved a youth between the ages of 13-18.

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Gender of Juvenile: 2013*

Gender	Frequency	Percentage
Female	208	29.5%
Male	496	70.5%

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Gender of Juvenile: 2014*

Gender	Frequency	Percentage
Female	194	26.5%
Male	539	73.5%

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Race of Juvenile

Of the 733 Cases:	Frequency (#)	Percent (%)
Black/Other	598	81.6
White	135	18.4

48

2014* Juvenile offenses	ALL Juv Cases (n=733)	Offenses committed by youth Registered in Heat Wave
January	86	2
Feb	104	9
March	93	8
April	95	5
May	121	9
June	87	1
July	92	4
August	16*	1
Total to date	694 95%	39 5%

6 HW youth charged with a crime during summer date range

Responding agency: GPD (5), ACSO (1)

1 Female*, 5 males

6 cases involved: loitering, burglary US*, marijuana, Resisting (2), petit theft

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The Result?

- Citizinvestor Campaign Launched
- $10,000 given to the department by the CC
- $1,000 donated by the Police Benevolent Society who happened to be in the auditorium
- $1,000 donated by Pepsi

HOW CAN I COMPARE MY ORGANIZATION TO OTHERS ACROSS THE COUNTRY?

NRPA

https://www.nrpa.org/PRORAGIS/

Let's Explore…

In Conclusion

- If we can do it, YOU can do it!
- Don't be afraid of statistics!
- Partner for help if you need to
- Tell your story!
  - 5-10% statistics remembered
  - 65-70% anecdote + statistics remembered

Thank you for coming…

Questions?