

MFE 634:
PRODUCTIVITY AND
QUALITY ENGINEERING

**RE-OPENING OF
SCHOOLS**

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Syracuse University; Spring 2021

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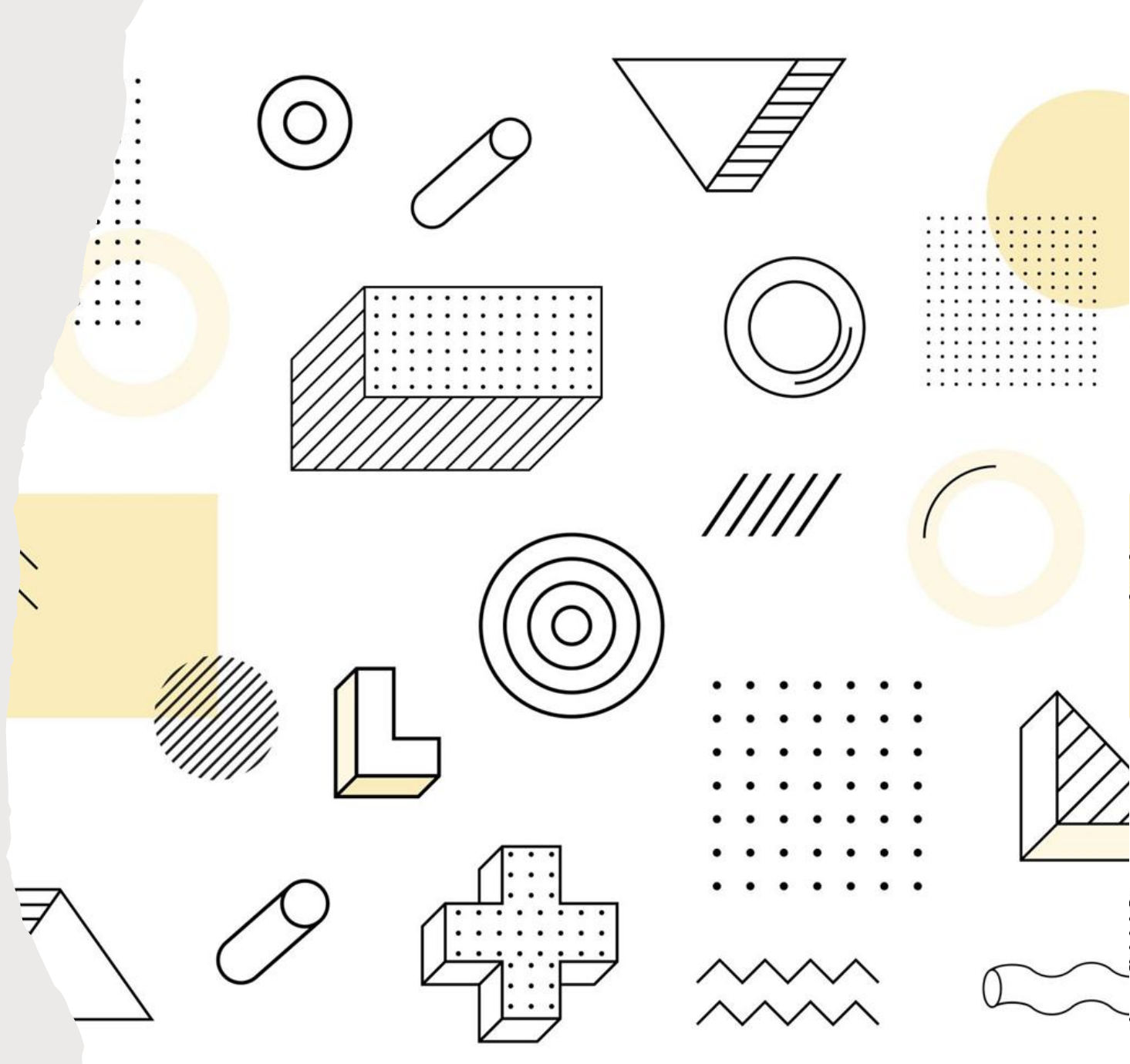


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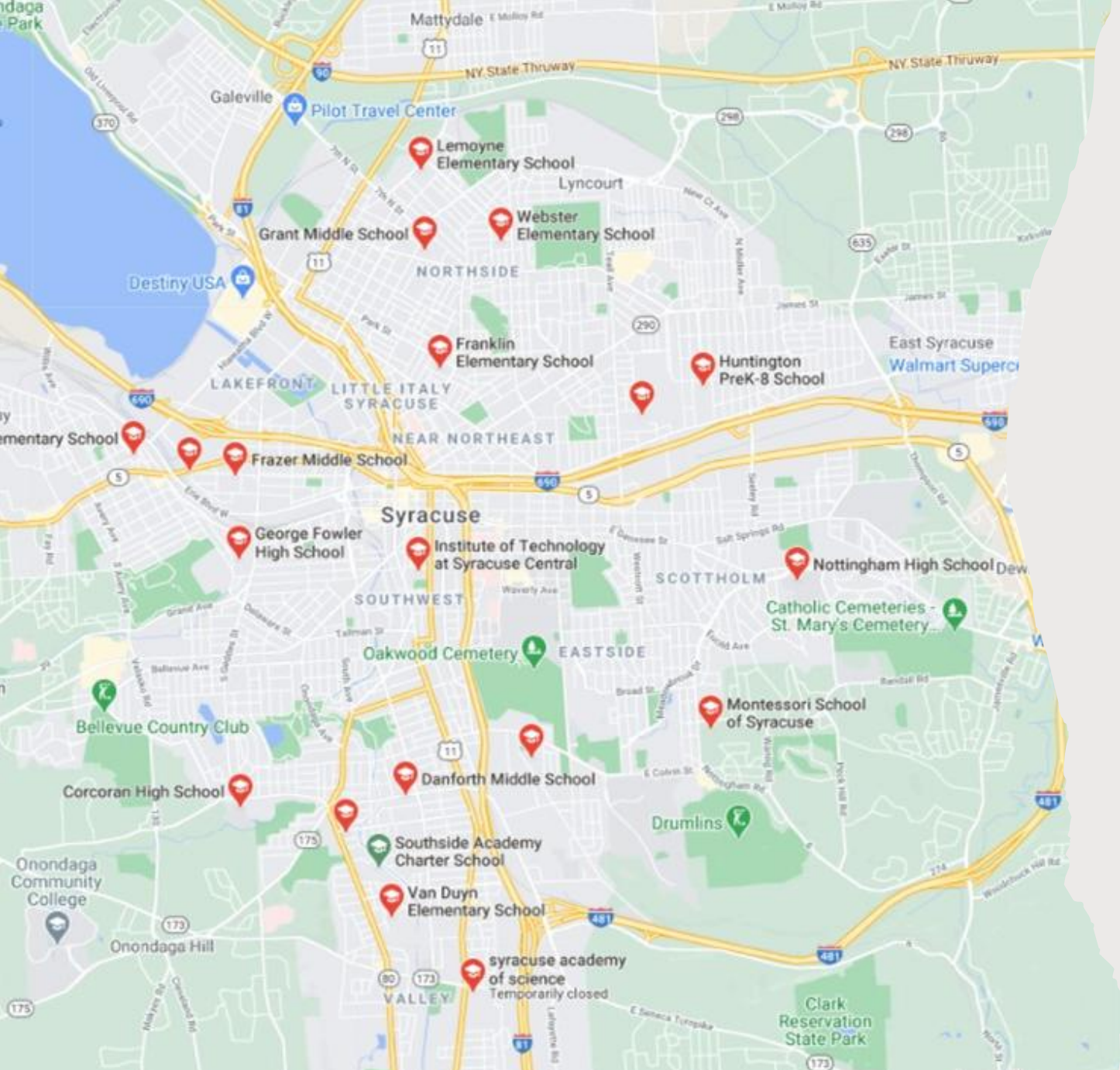
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INTRODUCTION

- ❑ The most important actions for school administrators to take before reopening in-person services and facilities are **planning and preparing**.
- ❑ Some of the strategies school administrators should consider while developing their EOP(Emergency Operations Plans):
 - ✓ **Monitor local COVID-19 data**
 - ✓ **Adopt mitigation strategies to promote healthy behaviors**
 - ✓ **Examine accessibility of information and resources to reduce spread of COVID-19**
 - ✓ **Assess students' special needs**

SCHOOLS IN SYRACUSE, NY



High Schools

Corcoran
 Henninger
 Institute of Technology (ITC)
 Nottingham
 PSLA @ Fowler

Alternative Programs

Adult Education
 Elmcrest
 McCarthy @ Beard
 Oasis Academy
 PFLA

Middle & Pre-K-8 Schools

Brighton Academy
 Clary Middle School
 Ed Smith Pre-K-8 School
 Expeditionary Learning Middle
 Frazer Pre-K-8 School
 Grant Middle School
 Huntington Pre-K-8 School
 HW Smith Pre-K-8 School
 Lincoln Middle School
 Roberts Pre-K-8 School
 Syracuse Latin
 Syracuse STEM @ Blodgett

Elementary Schools

Bellevue Elementary School
 Delaware Primary
 Dr. Weeks Elementary School
 Franklin Elementary School
 LeMoyne Elementary School
 McKinley-Brighton Elementary
 Meachem Elementary School
 Montessori @ Lemoyne
 Porter Elementary School
 Salem Hyde Elementary School
 Seymour Dual Language Academy
 STEAM @ Dr. King
 Van Duyn Elementary School
 Webster Elementary School



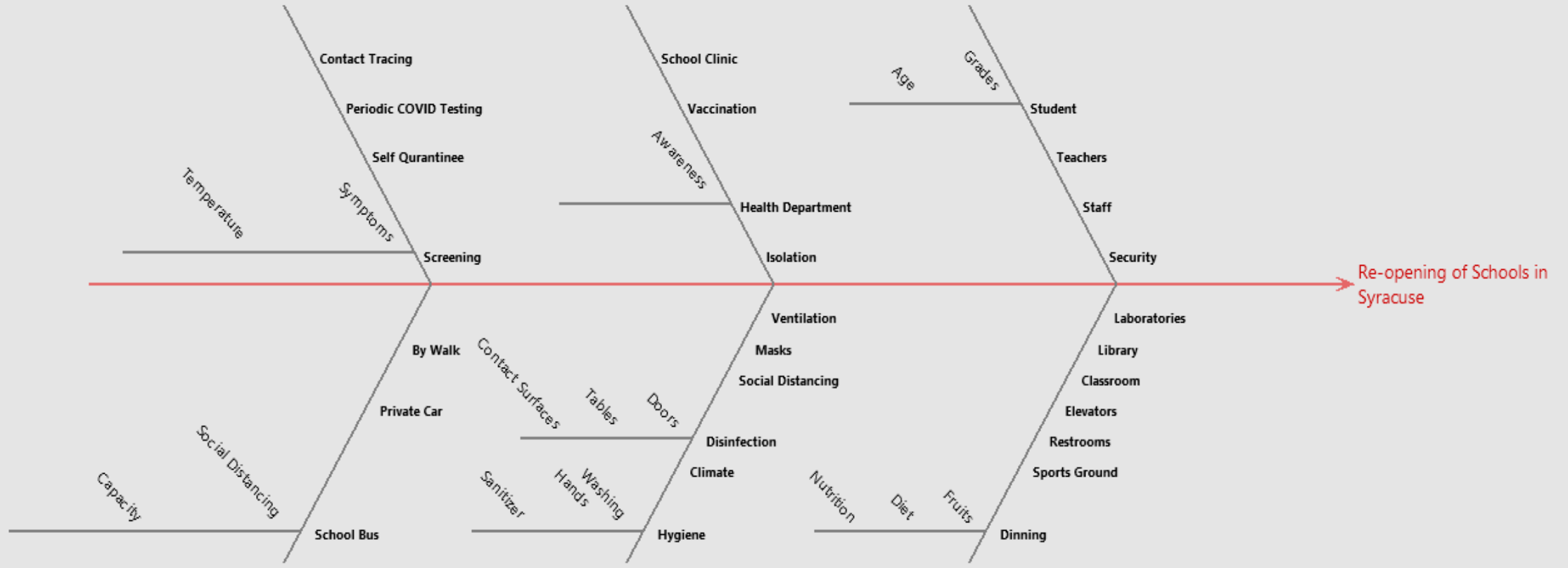
BRAINSTORMING

Brainstorming is a group creativity technique by which efforts are made to find a conclusion for a specific problem by gathering a list of ideas spontaneously contributed by its members

AFFINITY DIAGRAM

MEASUREMENTS	MATERIALS	MAN	ENVIRONMENT	METHODS	MACHINES
School Clinic	Dinning	Students	Screening	Ventilation	By Walk
Vaccination	Nutrition	Faculty	Symptoms	Masks	Private Car
Health Department	Diet	Staff	Temperature	Social Distancing	School Bus
Awareness	Fruits	Security	Self-quarantine	Disinfection	Social Distance
Isolation/ Quarantine	Sports Ground		Periodic COVID Testing	Doors, Tables, Contact Surfaces	Capacity
	Restrooms		Contact Tracing	Climate	
	Classroom			Hygiene	
	Elevators			Washing Masks	
	Laboratories & Library			Sanitizer	

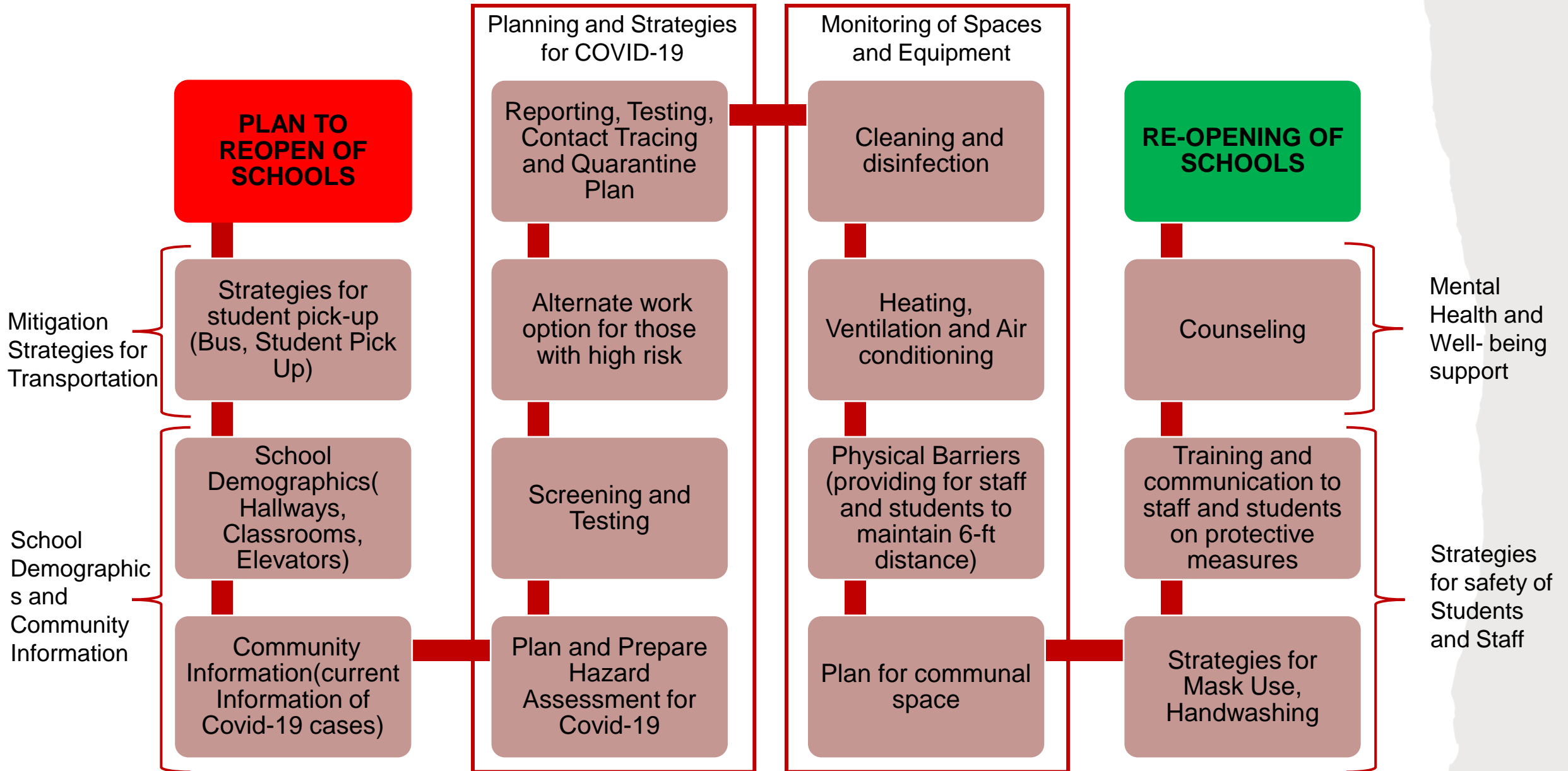
ISHIKAWA CHART



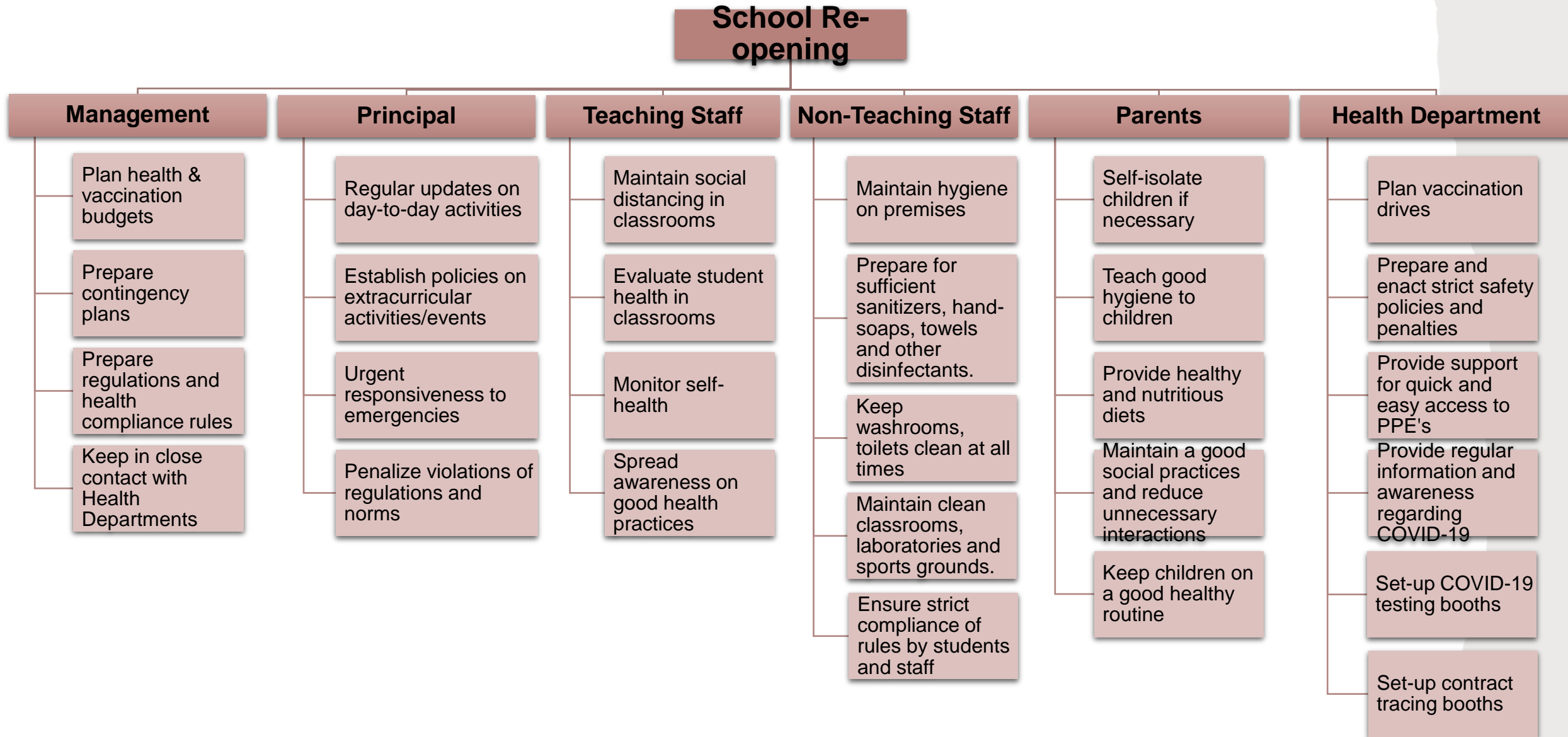
PROCESS FLOW CHART



PROCESS FLOW CHART (contd...)



ORGANIZATIONAL FLOWCHART



COST OF POOR QUALITY

COPQ	Internal Failures	External Failures	Appraisal Failures	Prevention Failures
Hygiene	<ul style="list-style-type: none"> - Not washing hands before and after meals - Improper Ventilation 	<ul style="list-style-type: none"> - Insufficient cleaning materials - Unclean utensils and takeaway boxes - Usage of unsanitary equipment 	<ul style="list-style-type: none"> - Periodic checklists for cleaning equipment inclusive of checking expiration - Food quality checks 	<ul style="list-style-type: none"> - Quality checks by health department - Sufficient inventory for hygiene related materials
Social Distancing	<ul style="list-style-type: none"> - Students and faculty ignoring the 6 feet gap - Overcrowding of spaces 	<ul style="list-style-type: none"> - Lack of open spaces 	<ul style="list-style-type: none"> - Proper planning for classroom capacities, social distancing practices 	<ul style="list-style-type: none"> - Awareness on social distancing protocols and repercussions
PPEs	<ul style="list-style-type: none"> - No usage of masks, face-shields, gloves 	<ul style="list-style-type: none"> - Shortage of PPEs from supplier 	<ul style="list-style-type: none"> - Quality checks of PPEs received in the facility - Demand Planning for PPEs 	<ul style="list-style-type: none"> - Awareness on wearing PPEs and their consequences for not wearing them
COVID Testing & Tracing	<ul style="list-style-type: none"> - Lack of testing technology - Lack of testing materials - Lack of testing sites - Lack of contact tracing system 	<ul style="list-style-type: none"> - Improper disposals of used testing materials - Lack of training to handle highly contagious samples 	<ul style="list-style-type: none"> - Training of employees for testing, tracing and equipment handling - Proper database management for testing, tracing 	<ul style="list-style-type: none"> - Proper checklists for every equipment and material - Barcodes for sample classification and error-proofing
Personnel	<ul style="list-style-type: none"> - Lack of knowledge for using online class platforms - Lack of awareness on safety measures and precautions 	<ul style="list-style-type: none"> - Lack of surveillance for maintaining safety measures - Software malfunctions 	<ul style="list-style-type: none"> - Proper training for online classes to faculty and students - Scrutiny for maintain safety measures 	<ul style="list-style-type: none"> - Simplified steps for connecting over internet for online classes - Proper resource allocation for health staff

QUALITY ASSESSMENT

INDIVIDUALS TO INTERVIEW

Head of Department of Public Safety

Head of Health Department

Head of Transportation Department

Head of Information Technology Department

School Principal

Teaching & Non-Teaching Staff

Parents

QUALITY ASSESSMENT QUESTION AND ANSWERS FOR INDIVIDUALS TO INTERVIEW

Head of Department of Public Safety:

- ❑ Will there be consistent patrolling in and around school?
 - ✓ Yes, in and around the campus will be patrolled even after school hours.
- ❑ Will there be an officer present at crowded places on school premises (library, canteen, etc.)?
 - ✓ Yes, there will an officer present to maintain the capacity of crowded places and avoid the spread of COVID-19.

Head of Health Department:

- ❑ What kind of face coverings are permitted?
 - ✓ Face covering are required by all students when on campus and it should be covering the students nose and mouth.

QUALITY ASSESSMENT QUESTION AND ANSWERS FOR INDIVIDUALS TO INTERVIEW

Head of Transportation Department:

- ❑ Are the contracted-transportation providers subject to the same minimum standards required by schools?
 - ✓ Yes, contracted transportation providers must ensure that students wear face coverings while travelling in bus. They should also ensure that students adhere to social distancing requirements during transportation to and from school and are required to adhere to the vehicle cleaning and disinfecting protocols.
- ❑ Will the buses run with the same frequency?
 - ✓ The buses will run with the same frequency while maintaining the minimum standards required for COVID-19.

QUALITY ASSESSMENT QUESTION AND ANSWERS FOR INDIVIDUALS TO INTERVIEW

Head of Information Technology Department:

- ❑ Will students have access to a Hybrid course structuring?
 - ✓ Yes, students will have access to the remote applications enabling an online course study module.
- ❑ Can students sign in to Zoom without any issues?
 - ✓ Yes, students can log on to Zoom without any issues and can contact IT Department immediately if in any trouble.

School Principal:

- ❑ Will students receive emails if there are any change in rules?
 - ✓ Yes, emails will be sent out on a weekly basis to inform students of any state or school rule updates.

QUALITY ASSESSMENT QUESTION AND ANSWERS FOR INDIVIDUALS TO INTERVIEW

Teaching & Non-Teaching Staff:

- ❑ What are the obstacles faced by teachers in the online style of instruction?
 - ✓ Since a few teachers are not accustomed to the online training mode, they face problems with the use of online resources and software.
- ❑ Is the non-teaching staff well equipped for maintaining hygiene and safety in school premises?
 - ✓ Training sessions have been conducted in order to train the staff with the safety protocols and procedures.

Parents:

- ❑ Are parents sending their kids to school feeling uncomfortable?
 - ✓ Majority of the parents are comfortable sending their children to schools for in-person experience.

INFECTED CASES IN ONEIDA COUNTY

District	County	Enrollment	Total cases / 1000 students	Total cases	Students In-Person	Students remote	Staff
Sherrill	Oneida	1411	28.3	40	9	20	11
Waterville	Oneida	705	25.5	18	10	0	8
Oriskany	Oneida	653	23	15	1	3	11
New Hartford	Oneida	2565	22.2	57	18	24	15
Clinton	Oneida	1247	21.7	27	11	10	6
Sauquoit Valley	Oneida	942	20.2	19	7	5	7
Whitesboro	Oneida	3053	19	58	4	33	21
Remsen	Oneida	439	18.2	8	3	0	5
Adirondack	Oneida	1161	18.1	21	5	8	8
Westmoreland	Oneida	919	16.3	15	7	2	6
Holland Patent	Oneida	1241	16.1	20	5	6	9
NY Mills	Oneida	560	16.1	9	3	3	3
Camden	Oneida	2010	15.4	31	0	14	17
Rome	Oneida	5288	11.9	63	0	32	31
Utica	Oneida	9665	6	58	0	10	48

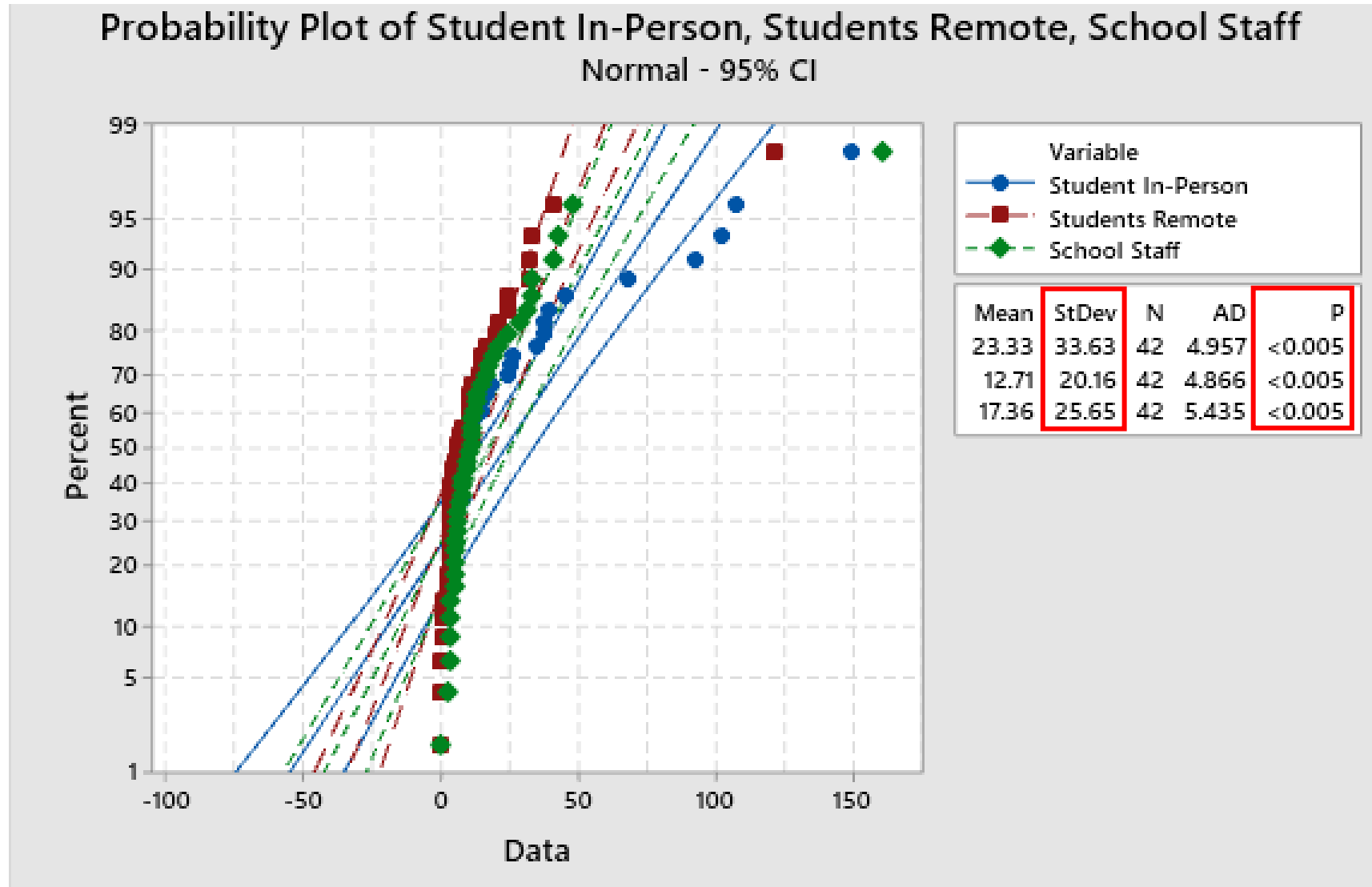
INFECTED CASES IN ONONDAGA COUNTY

District	County	Enrollment	Total cases / 1000 students	Total cases	Students In-Person	Students remote	Staff
Skaneateles	Onondaga	1296	46.3	60	35	15	10
Solvay	Onondaga	1457	30.9	45	24	10	11
Lafayette	Onondaga	869	29.9	26	6	15	5
Westhill	Onondaga	1699	28.3	48	37	0	11
Baldwinsville	Onondaga	5333	28.1	150	93	24	33
West Genesee	Onondaga	4300	24.9	107	68	10	29
Liverpool	Onondaga	6836	24.4	167	108	16	43
Tully	Onondaga	738	24.4	18	15	3	0
North Syracuse	Onondaga	8248	22.3	184	102	41	41
Syracuse	Onondaga	20028	21.6	433	150	122	161
Fayetteville-Manlius	Onondaga	3993	20.8	83	39	11	33
Jordan-Elbridge	Onondaga	1020	19.6	20	12	3	5
Jamesville-DeWitt	Onondaga	2597	18.1	47	37	4	6
Lyncourt	Onondaga	393	17.8	7	3	1	3
Marcellus	Onondaga	1478	17.6	26	11	3	12
Onondaga	Onondaga	821	17.1	14	4	7	3
Fabius-Pompey	Onondaga	593	15.2	9	1	3	5
East Svracuse							

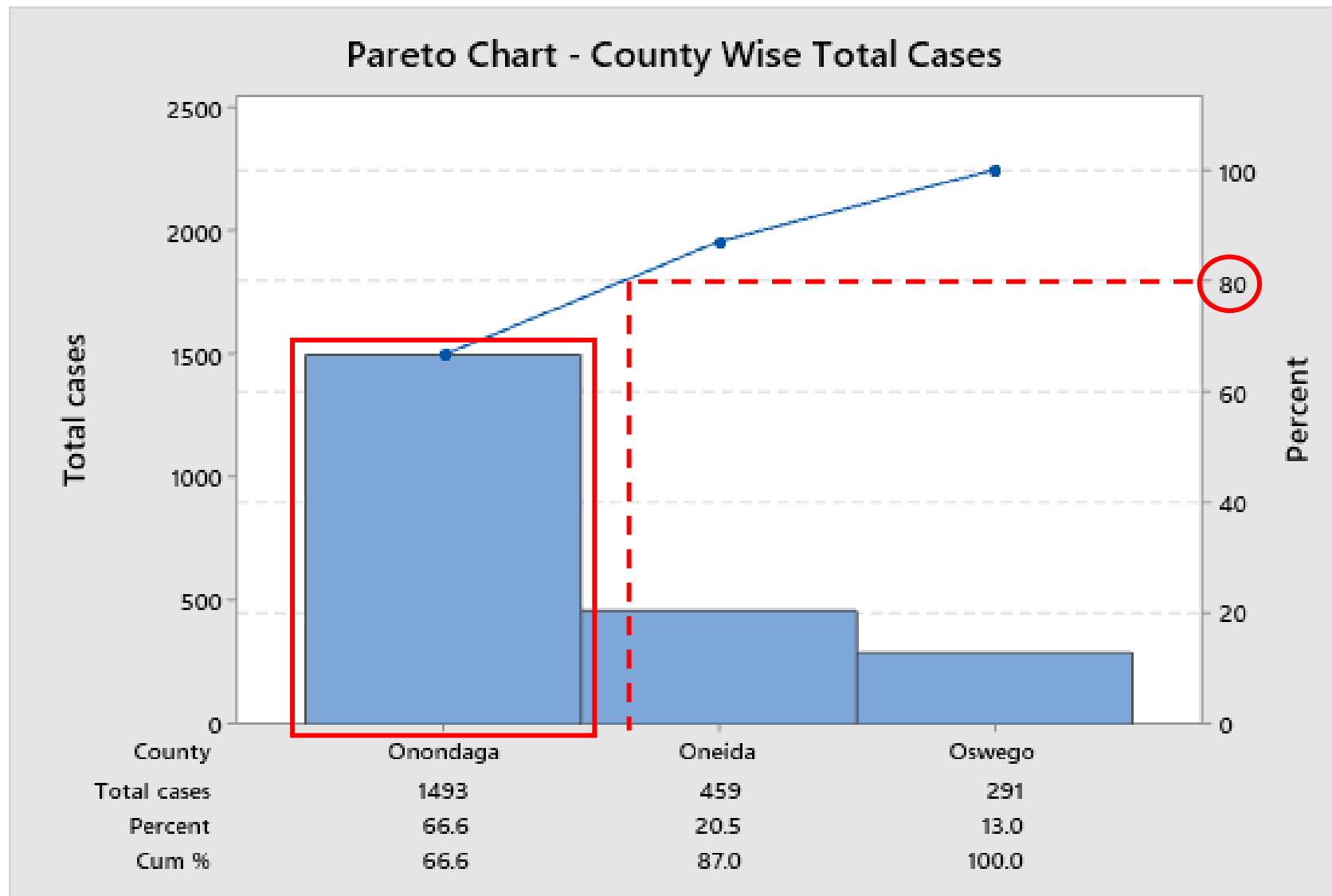
INFECTED CASES IN OSWEGO COUNTY

District	County	Enrollment	Total cases / 1000 students	Total cases	Students In-Person	Students remote	Staff
Central Square	Oswego	3574	22.9	82	26	32	24
Altmar-Parish-Williamstown	Oswego	450	22.2	10	6	1	3
Mexico	Oswego	2003	20.5	41	25	3	13
Fulton	Oswego	3226	20.1	65	45	1	19
Phoenix	Oswego	1644	13.4	22	10	4	8
Pulaski	Oswego	972	13.4	13	5	3	5
Hannibal	Oswego	1400	12.9	18	3	6	9
Oswego	Oswego	3528	9.9	35	16	3	16
Sandy Creek	Oswego	653	7.7	5	1	2	2

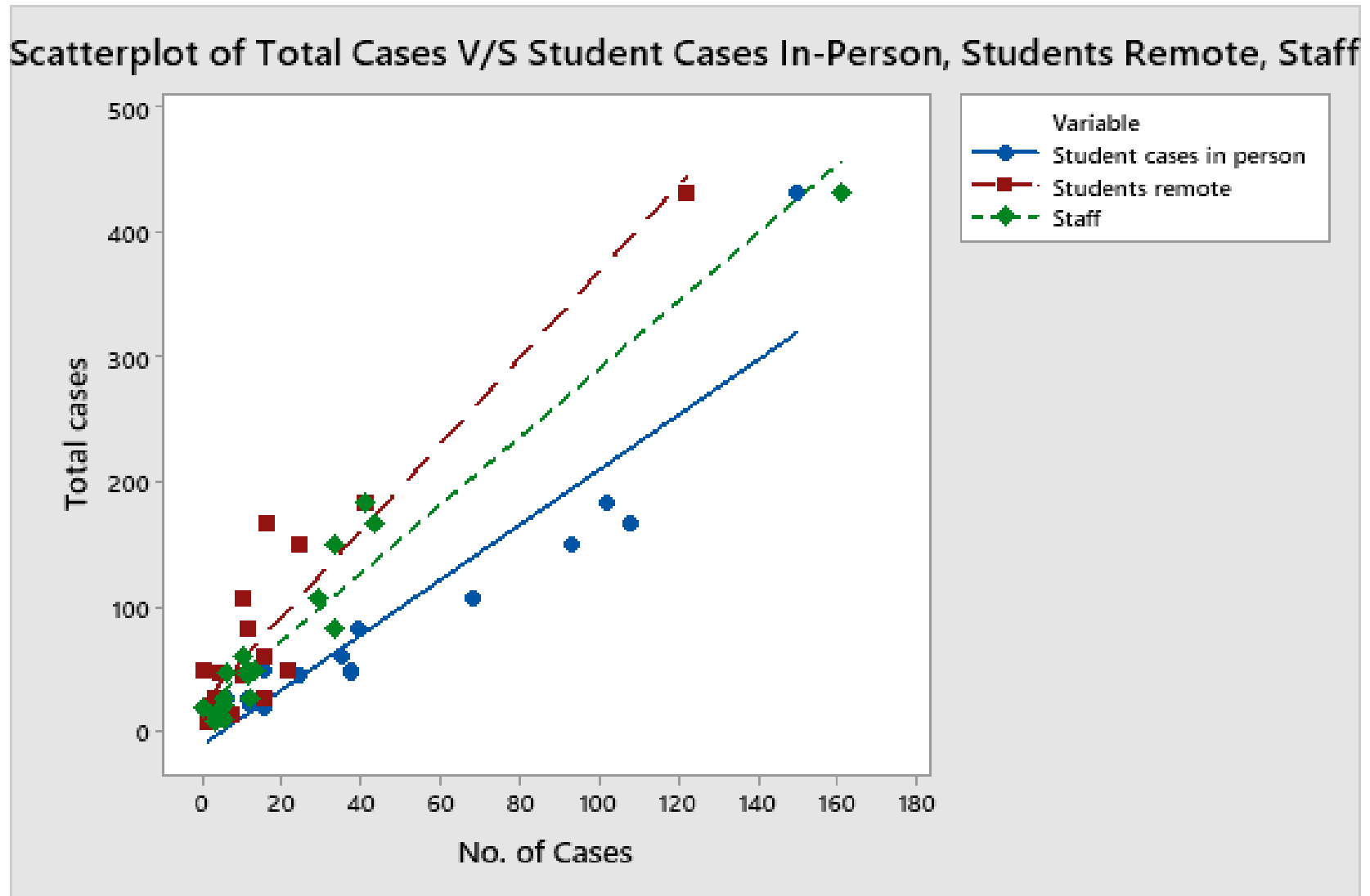
PROBABILITY PLOT



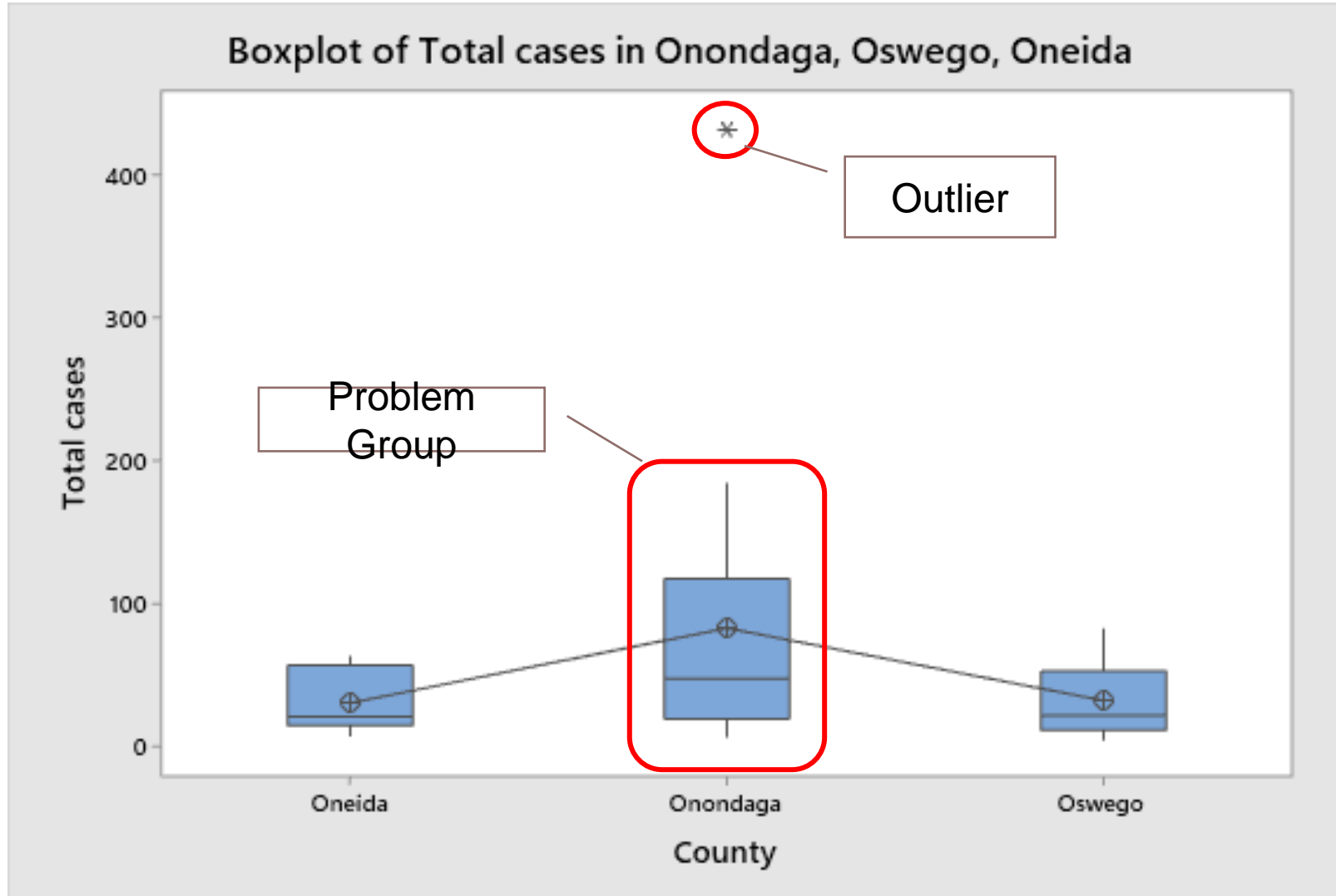
PARETO CHART



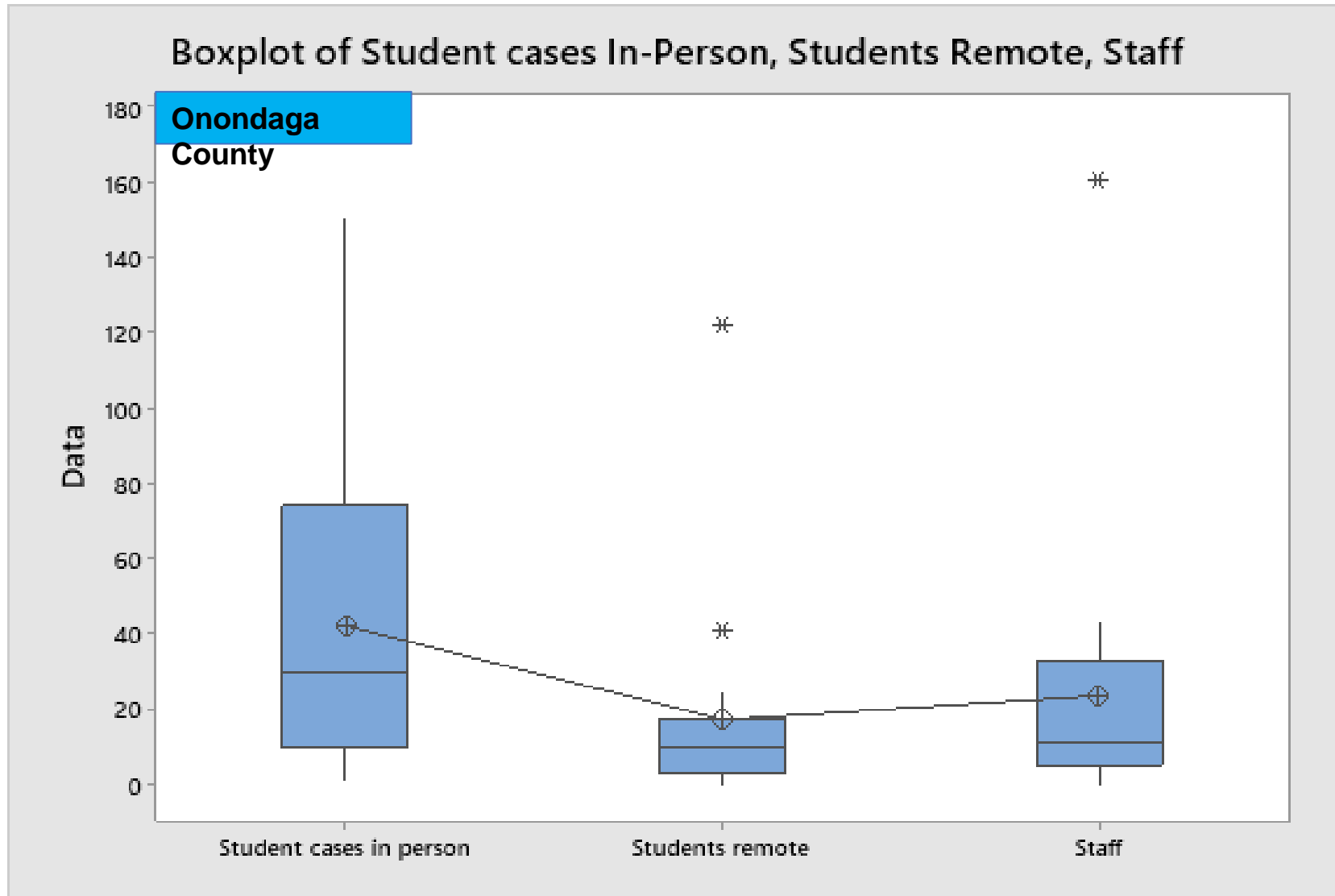
SCATTER PLOT



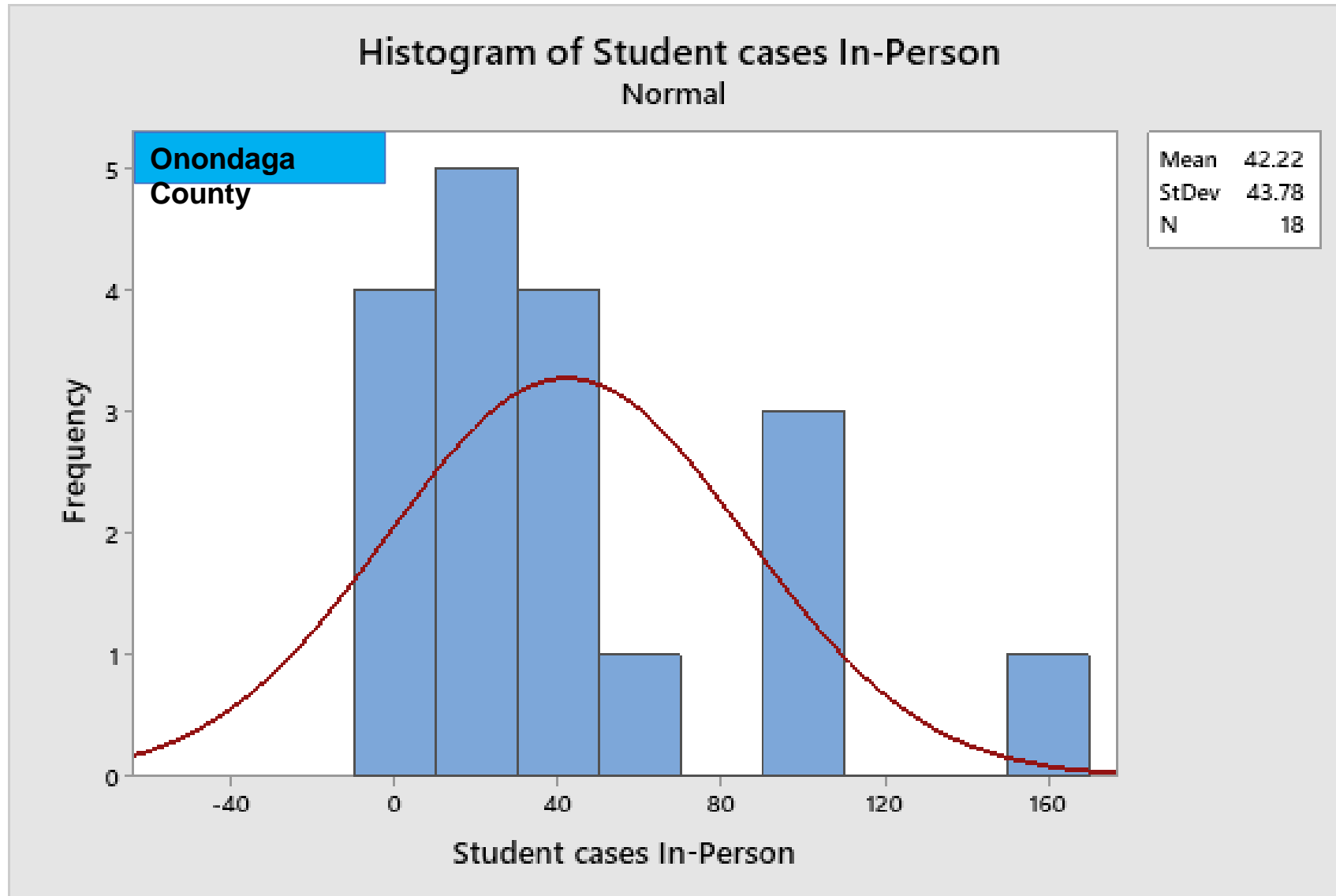
BOX PLOT



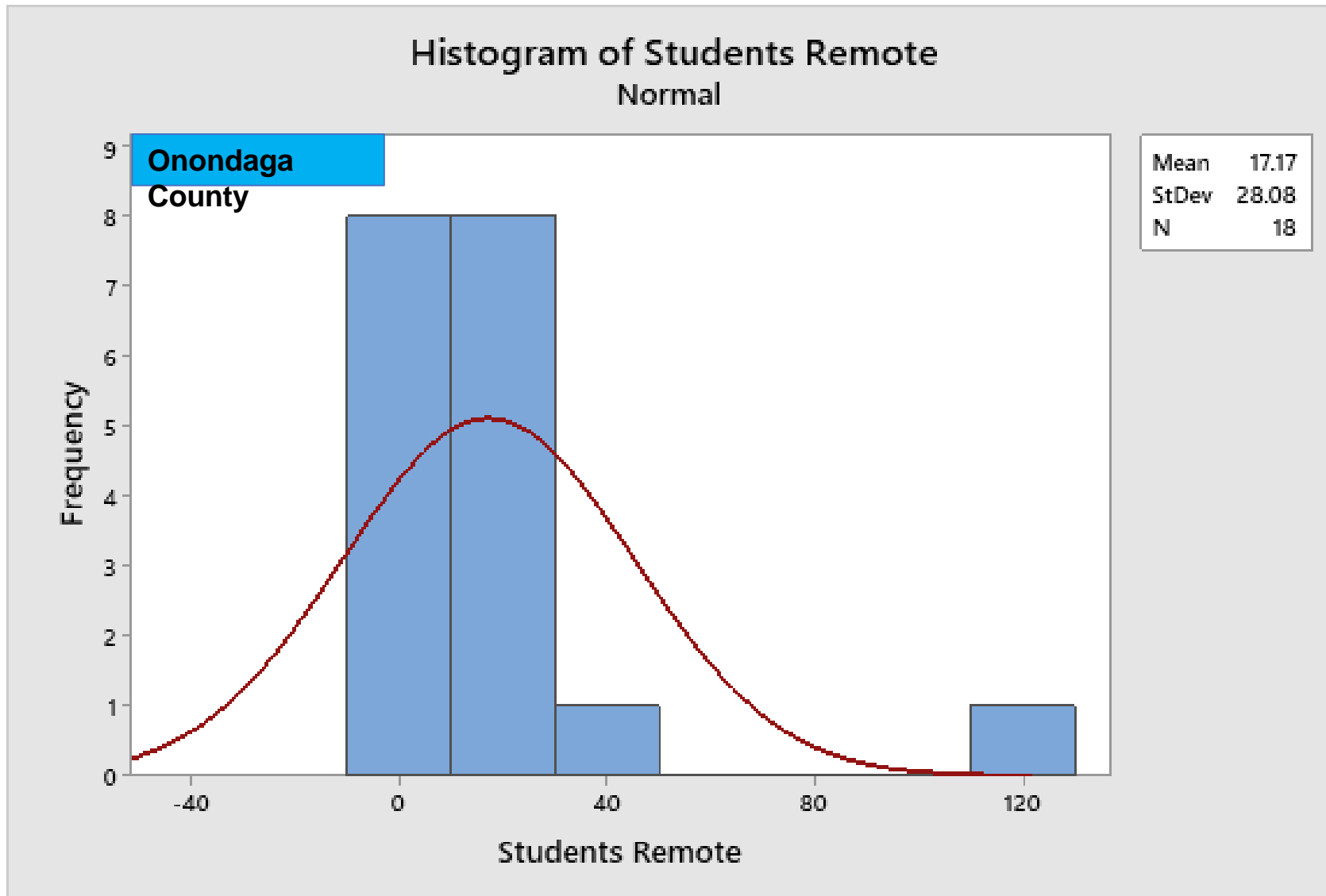
BOX PLOT (contd...)



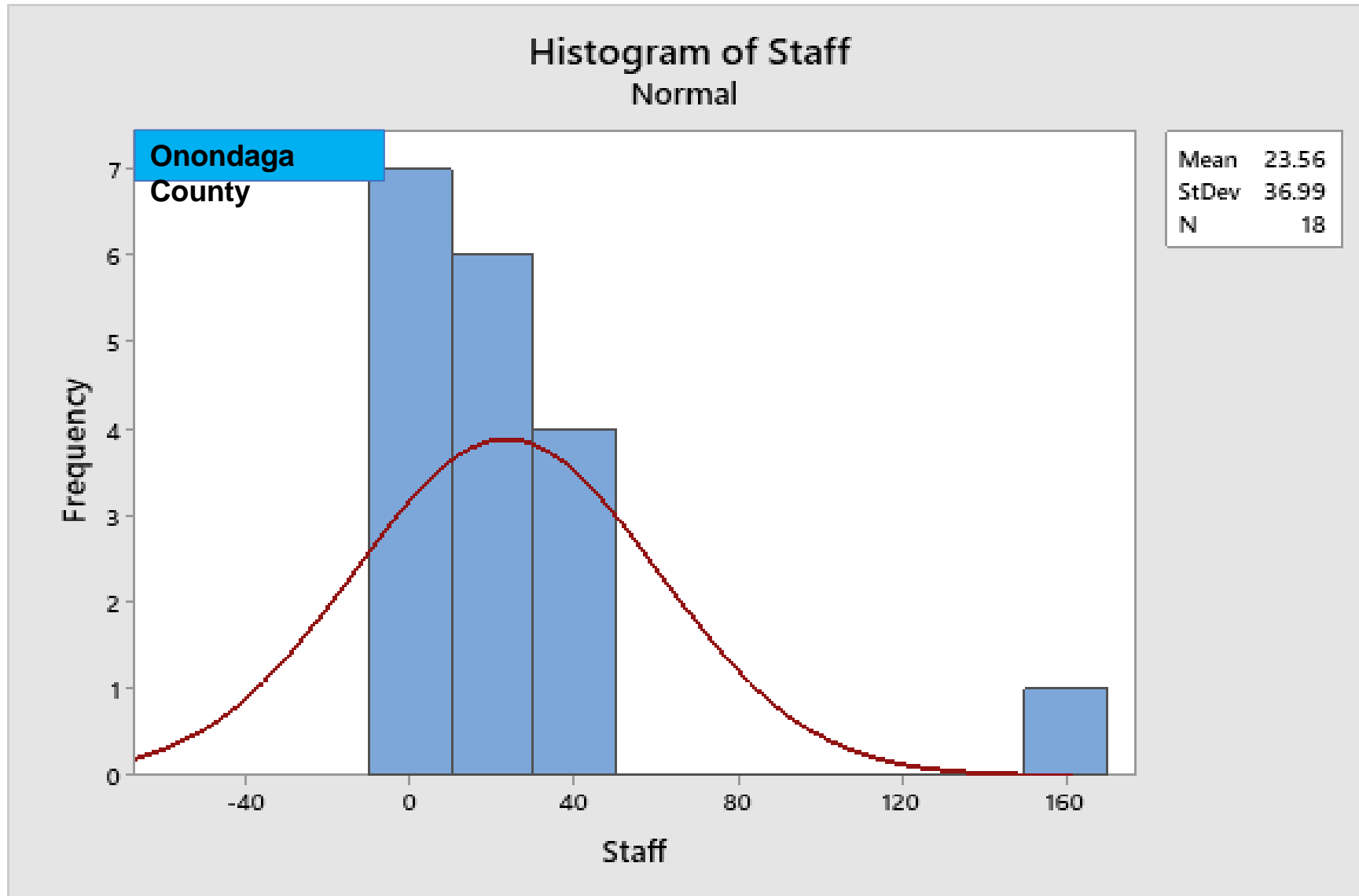
HISTOGRAM



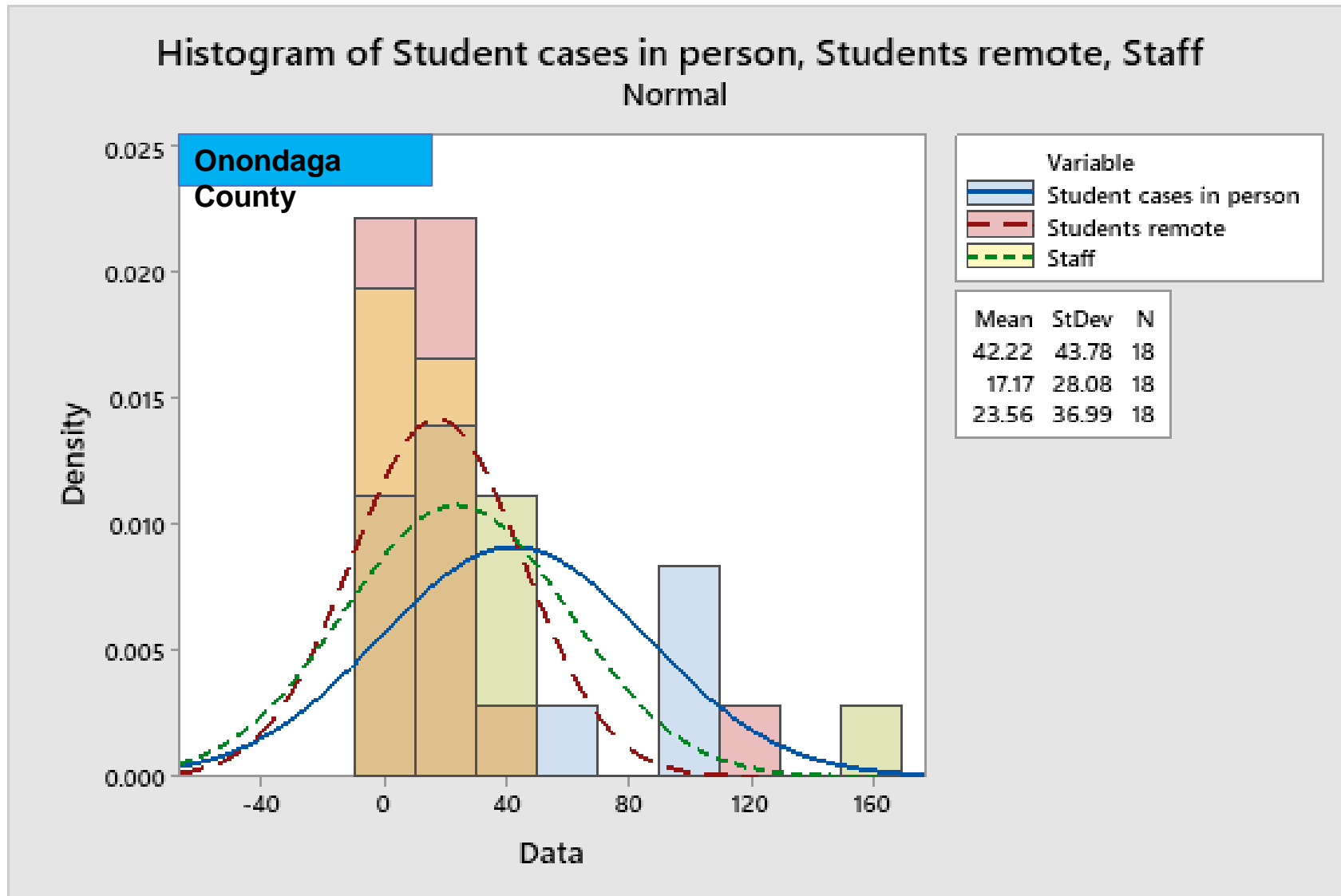
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HISTOGRAM(contd...)

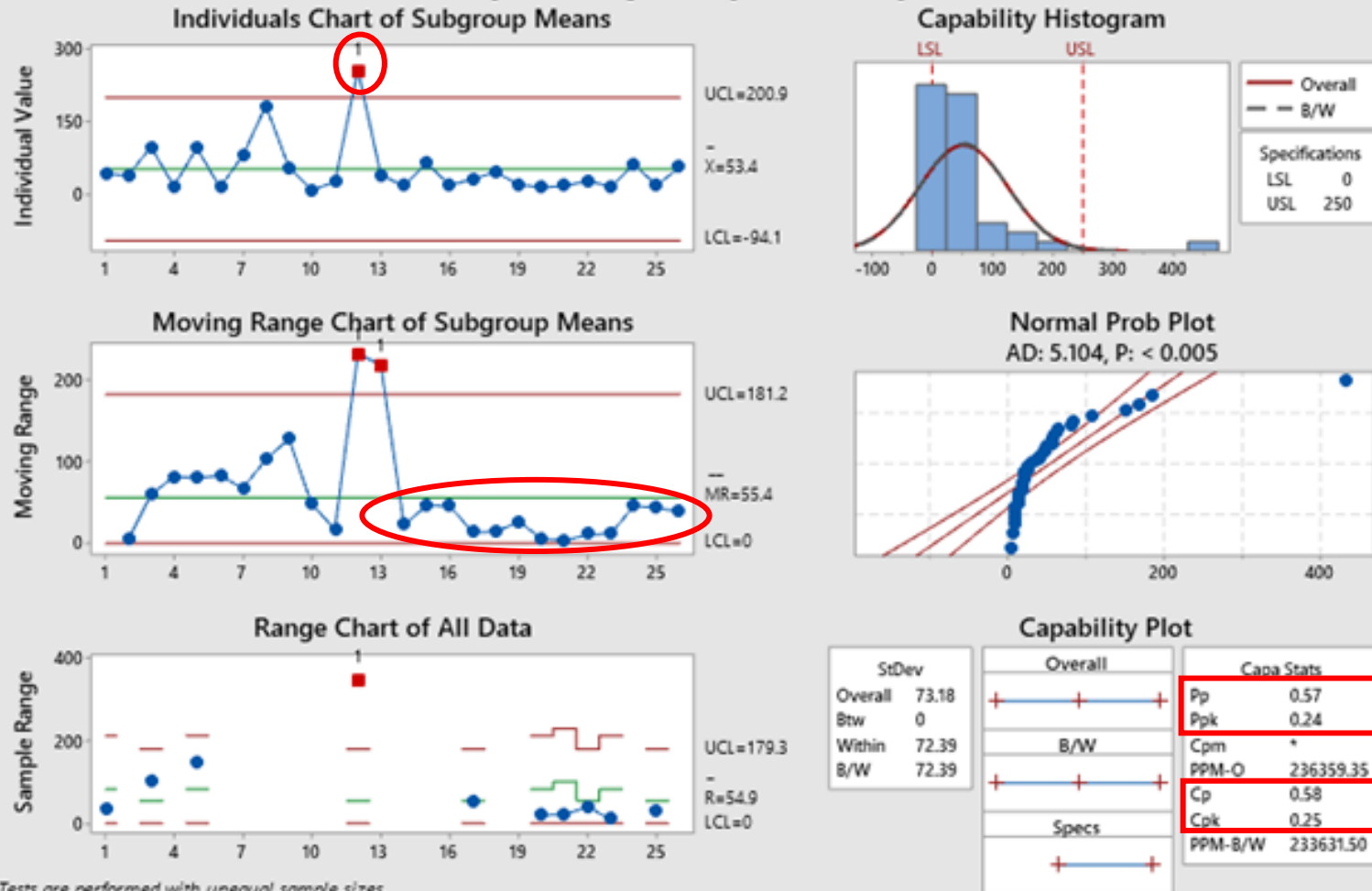


HISTOGRAM(contd...)



PROCESS CAPABILITY SIXPACK

Between/Within Capability Sixpack Report for Total cases



Tests are performed with unequal sample sizes.

The actual process spread is represented by 6 sigma.

I-MR CHART

