

# Measuring Micromobility Injuries with Emergency Department (ED) Data

*7<sup>th</sup> Annual Research on the Road, November 13, 2024*

**Lawrence Fung, MPH**

Injury and Violence Prevention Program

**Pierre Amiel, RN, MPH, DrPH Candidate**

Communicable Diseases

# Project purpose

- Use emergency department data to better understand patterns and trends of micromobility injuries
- Provide a more timely way to measure micromobility injury patterns
- Contribute to broader efforts to compare micromobility injury patterns across different data sets

MANHATTAN BRIDGE

## Horrific Crash on Manhattan Bridge Bike Path Underscores Moped Crisis

Illegal and legal mopeds are forbidden yet are increasingly common on the span as delivery workers shift to faster vehicles to make their meager living.

9:28 AM EDT on July 27, 2023



MICROMOBILITY

## The Moped Crisis — An Analysis: The City Needs a Systemic Fix, Justice for Workers and Accountability by Tech Giants

Mayhem — and, more accurately, the perception of mayhem — on the streets of the city is provoking a new backlash against delivery workers. But are poor workers really the ones to blame?

12:00 AM EDT on August 23, 2023

Outside

# Motorized Scooters Are Taking Over New York City's Bike Lanes

Electric and gasoline-powered scooters are changing the vibes in the Big Apple's soaring network of bicycle lanes. And columnist Eben Weiss isn't happy bout it.

Public

TRANSPORTATION

## NYC E-Bikes and E-Scooters Exceed Bicycles in Deaths

Pedaled e-bikes were involved in nine fatal crashes in 2022 and 12 in 2023 as of July 4, compared to 10 deaths in 2022 and six in 2023 from human-powered bikes.

July 17, 2023 •

Evan Simko-Bednarski, New York Daily News, TNS



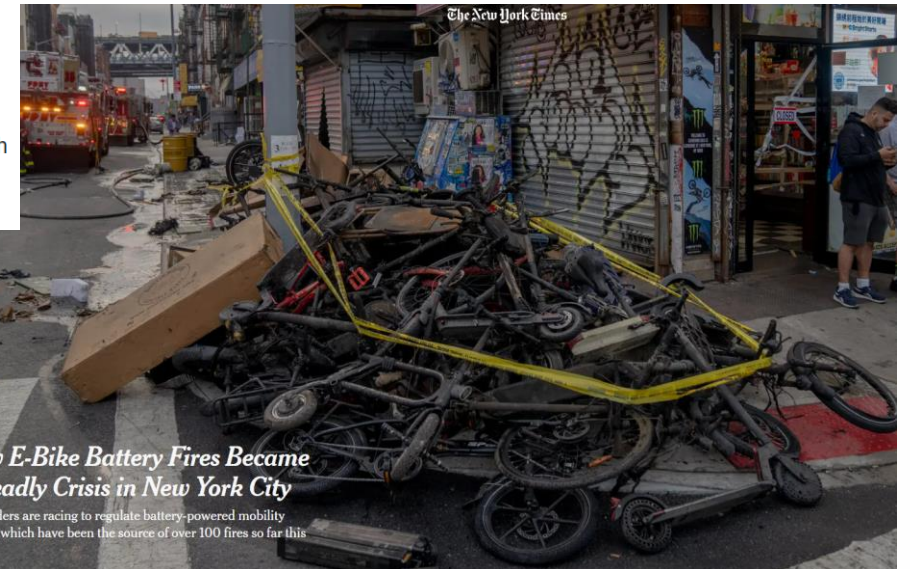
ADVERTISEMENT

### Latest News

WORKFORCE

A Renewed Effort to Bridge Government and Tech

Feb. 2, 2024



### How E-Bike Battery Fires Became a Deadly Crisis in New York City

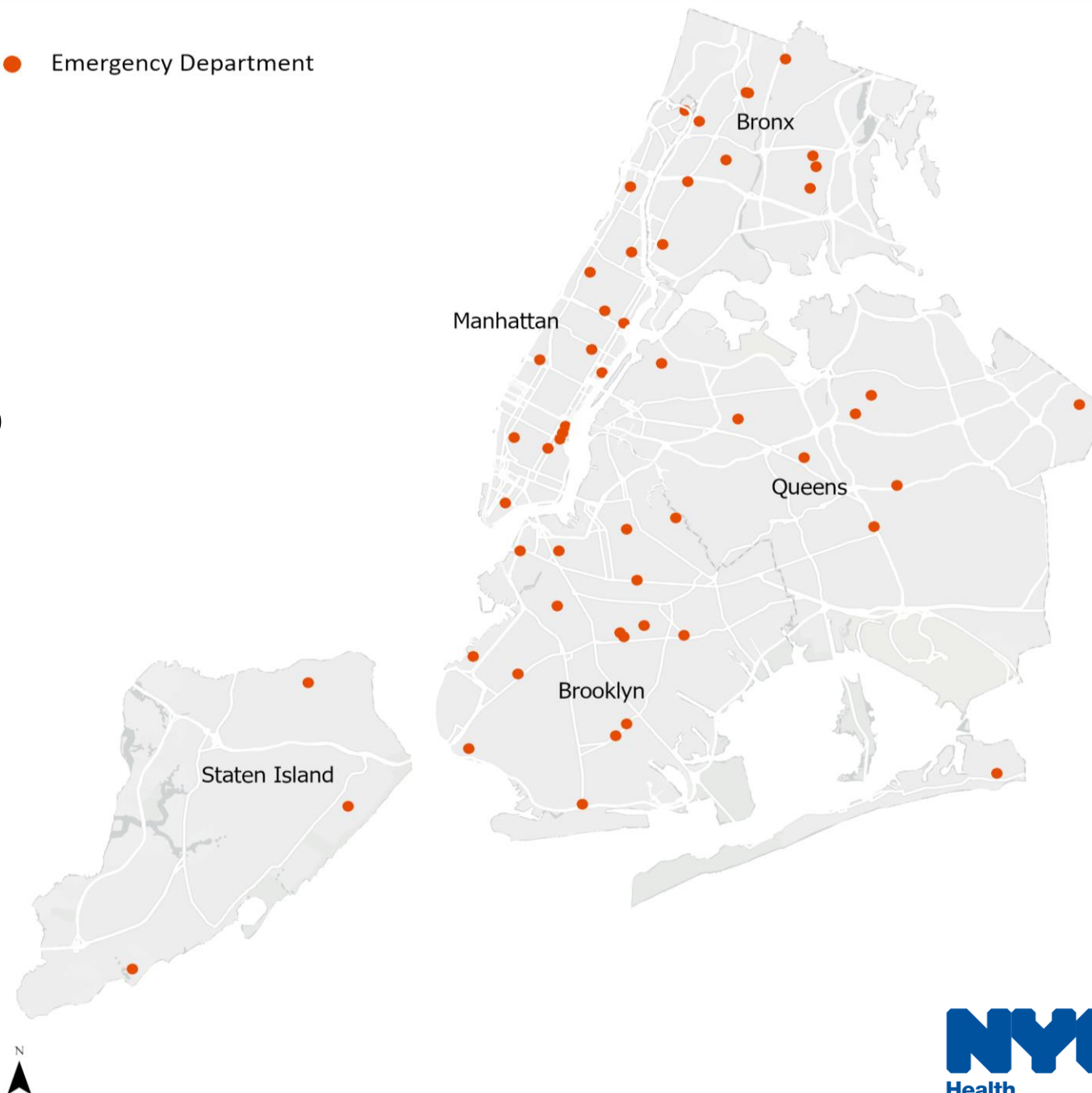
City leaders are racing to regulate battery-powered mobility devices, which have been the source of over 100 fires so far this year.

# Emergency Department Syndromic Surveillance System

- Set up in 2001 for early detection of bioterrorist attack
- Used to monitor emergency department visits to detect outbreaks early
- Required by Section 11.03(d) of the New York City Health Code. All ED patient encounters are sent to the Health Department on a daily basis
- Data received from all 53 hospitals in New York City
- Majority of hospitals send data hourly
- About 4 million visits per year (10,000-14,000 per day)

# Emergency Departments in All Boroughs Report Data to New York City's Syndromic Surveillance System

● Emergency Department



# Data Sources and Methods

- NYC Health Department syndromic surveillance data
- Variables received include:
  - Date and time of patient arrival
  - Reason for visit or chief complaint
  - Patient demographics (age, sex, zip code)
- Ages 16 and older
- January 2016 through present



# Data Sources and Methods

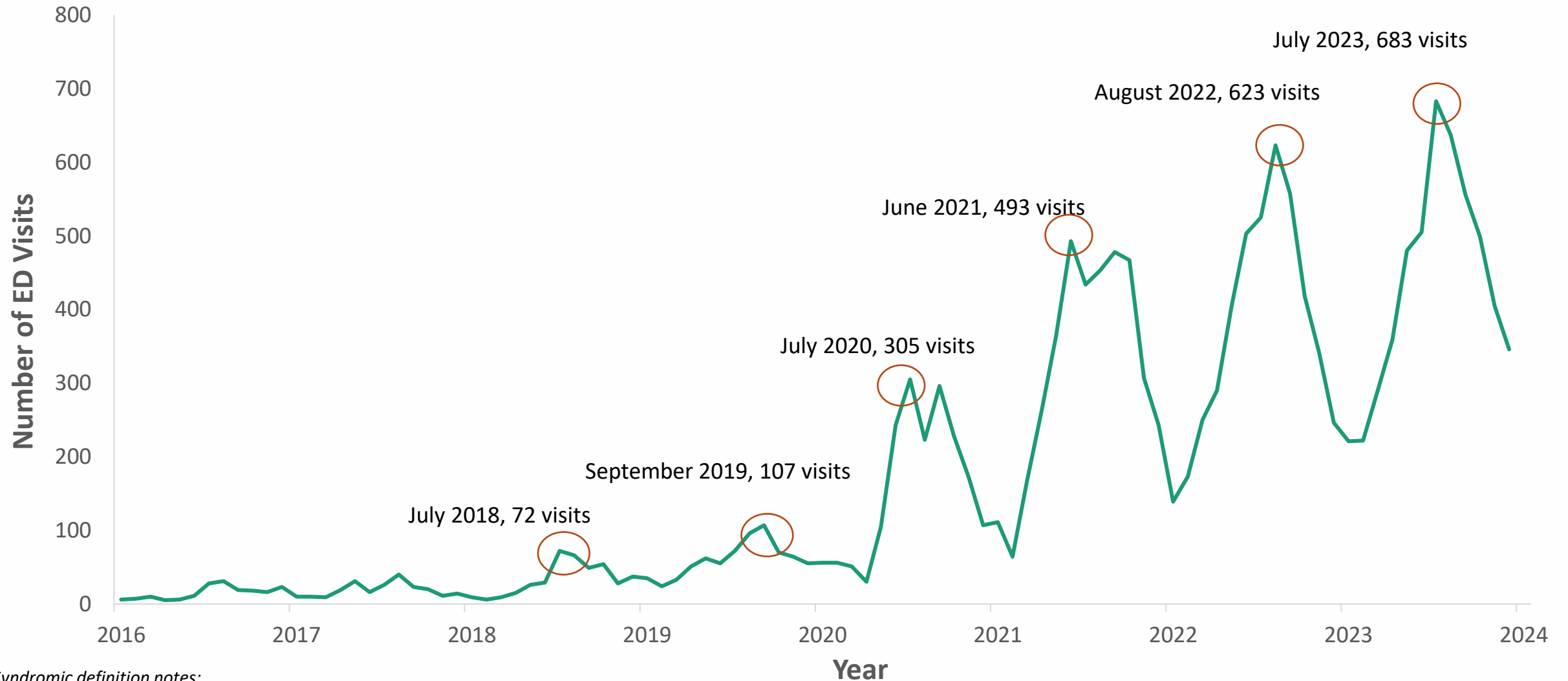
	A	B	C	D	E
1	date	time	chiefcomplaint	diagnosiscode	age
18042	8/15/2023	17:38	ARM PAIN	S52124A   S62111A	2
18043	8/15/2023	20:07	FALL   INJURY   LT FOOT PAIN	M79.672	
18044	8/15/2023	13:13	RT. HAND INJURY AFTER FALL FROM ELECTRIC BICYCLE ON SUNDAY   GCS 15	L08.9   S60.511A   V18.2XXA	3
18045	8/15/2023	15:43	S/P FALL OFF ELECTRIC SCOOTER, KNEE PAIN	M25.562   S43.101A   Z23   S8	2
18046	8/15/2023	18:56	FALL FROM E-SCOOTER LEFT FACE DOWN. -LOC. GCS 15   L SIDED FACIAL PAIN   DIZZINESS   ABRASIONS TO	S00.531A   M25.562   S00.12XA	3
18047	8/15/2023	11:13	OTHER   NECK PAIN	S12.01XA   W19.XXXA	3
18048	8/15/2023	12:28	MVA	M79.604   S80.212A   S92.321A	3
18049	8/15/2023	8:33	FALL   HEAD INJURY	W19XXXA   S0990XA   T07XXXA	3
18050	8/15/2023	16:52	DIZZY AND FELL OFF BICYCLE NOW HAVING KNEE PAIN   FELL OFF ELECTRIC SCOOTER   M25.561 PAIN IN F	M25.561   M25.511   V00.841A	4
18051	8/16/2023	21:09	M25.571 PAIN IN RIGHT ANKLE AND JOINTS OF RIGHT FOOT I10   SCOOTER VS TRUCK	M25.571   M25.572	5
18052	8/16/2023	3:09	MVA   MOTORCYCLE CRASH	S22.32XA	2
18053	8/16/2023	22:51	E-BIKE ACCIDENT   S92.424A NONDISPLACED FRACTURE OF DISTAL PHALANX OF RIGHT GREAT TOE, INITIAL	S92.424A	2
18054	8/16/2023	9:21	RIGHT KNEE INJURY;MVA   RIGHT KNEE PAIN	NA	5
18055	8/16/2023	1:01	TRAUMA   E-BIKE VS CAR	M54.2   T78.2XXA   M25.569	2
18056	8/16/2023	13:57	W19.XXXA UNSPECIFIED FALL, INITIAL ENCOUNTER I10	F07.81   S09.90XA	2
18057	8/16/2023	17:19	LACERATION	NA	3
18058	8/16/2023	0:18	PATIENT WAS HIT BY SCOOTER OTHER	S299XXA	4
18059	8/16/2023	12:33	OTHER   URINARY DISCOMFORT	A419   N12	7
18060	8/16/2023	9:08	PED STRUCK   S/P PEDS STRUCK	M25.551   M25.571   T14.90XA	3
18061	8/16/2023	16:50	FELL OFF SCOOTER R WRIST PAIN, GCS 15	M25.531   M79.601	
18062	8/16/2023	4:56	SMOKE INHALATION   BURN	T59.811A	2
18063	8/16/2023	4:58	SMOKE INHALATION	R06.02   T59.811A	4
18064	8/16/2023	10:00	SCOOTER ACCIDENT   MOTORCYCLE CRASH	R778   S72002A	6
18065	8/16/2023	22:41	ARM PAIN   EXTREMITY LACERATION   FALL   FALL FROM SCOOTER	V00841A	2
18066	8/16/2023	0:23	SPRAIN/STRAIN	S62.102A   S62.109A	2
18067	8/16/2023	9:16	PAIN TO KNEE AFTER FALL FROM ELECTRIC BIKE   KNEE PAIN   S82.001A UNSPECIFIED FRACTURE OF RIGHT	S82.001A	2
18068	8/16/2023	19:18	INJURY TO SHOULDER/FDNY	S42.309A	2
18069	8/16/2023	20:03	FALL FDNY	S93.409A	4

# Definition of scooter and e-bike syndrome

- Search patient admit reason, chief complaint, and triage note for keywords such as:
  - Scooter / “scoot” / “sckoot”
  - Electric Bike
  - Ebike
  - E-bike
  - Electric bicycle
  - Pedal-assist
  - Electric Citibike
- Does ***not*** include mobility scooter



## E-bike and scooter injury visits, ages 16+, January 2016 – December 2023



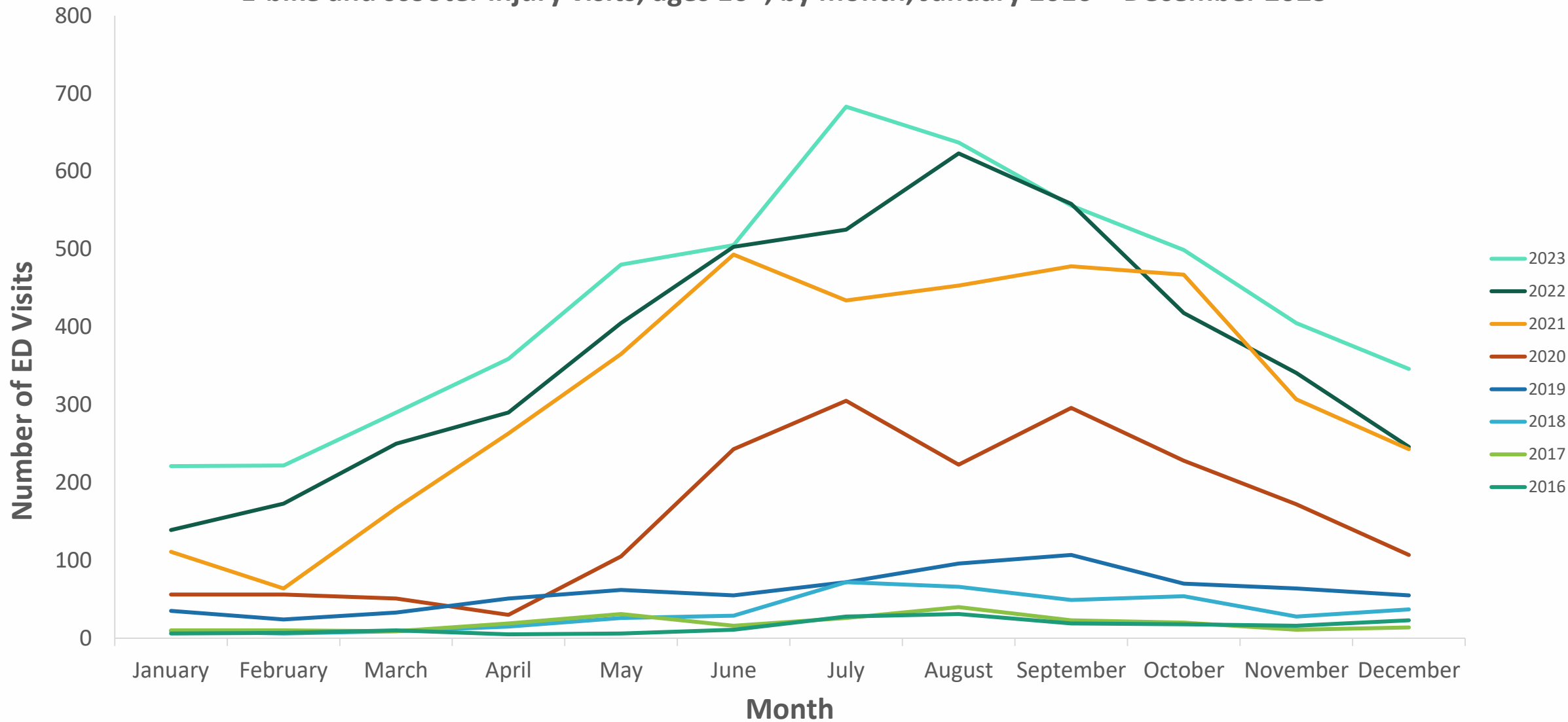
### Syndromic definition notes:

Scooter does not include mobility or non-motorized scooter; indicators for electric and motorized

E-bike includes e-bike, electric bike, electric citibike, and pedal assist

Keywords are searched in chief complaint, admit reason, and triage note data fields

# E-bike and scooter injury visits, ages 16+, by month, January 2016 – December 2023



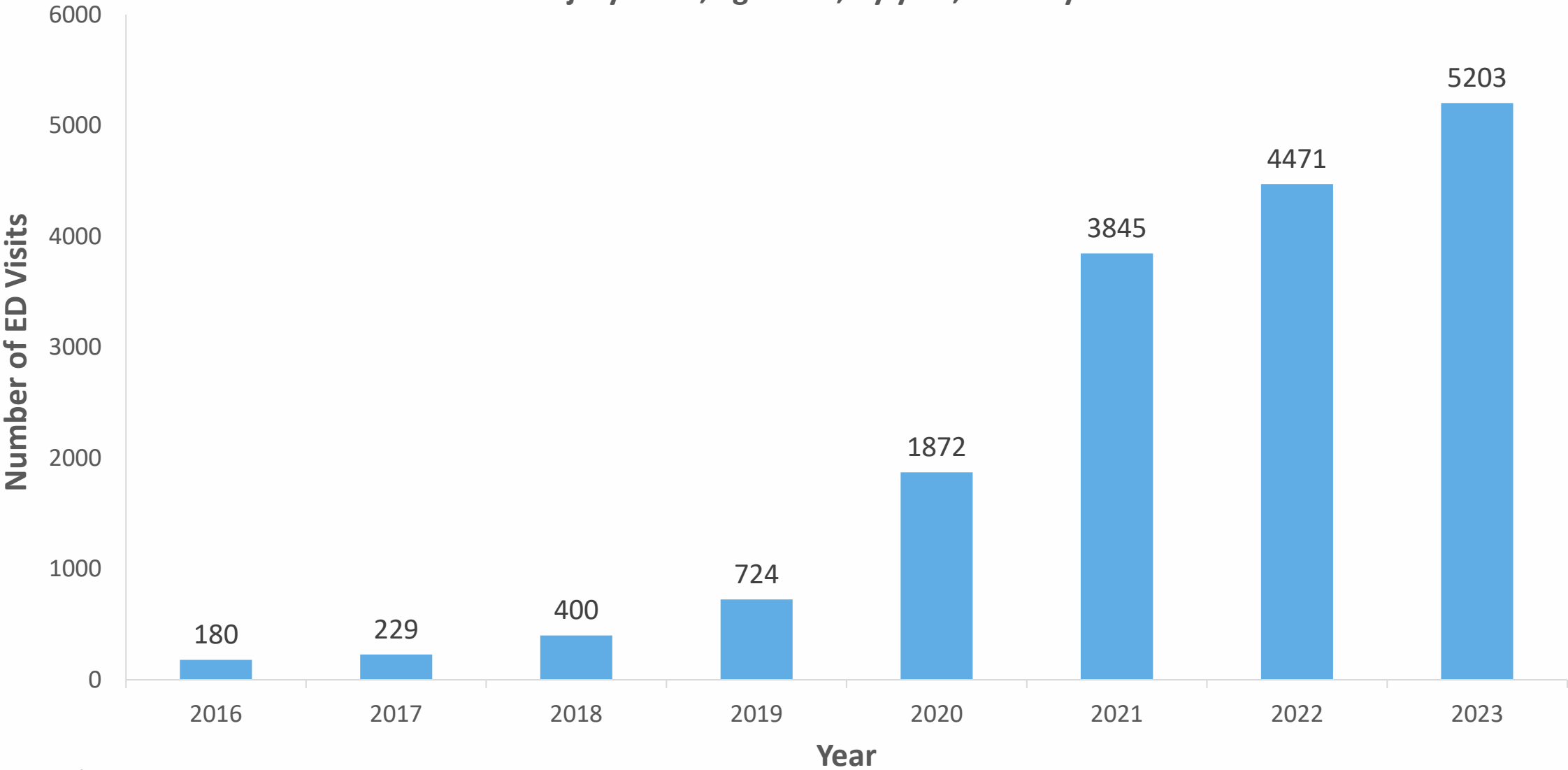
Syndromic definition notes:

Scooter does not include mobility or non-motorized scooter; indicators for electric and motorized

E-bike includes e-bike, electric bike, electric citibike, and pedal assist

Keywords are searched in chief complaint, admit reason, and triage note data fields

# E-bike and scooter injury visits, ages 16+, by year, January 2016 – December 2023



Syndromic definition notes:

Scooter does not include mobility or non-motorized scooter; indicators for electric and motorized

E-bike includes e-bike, electric bike, electric citibike, and pedal assist

Keywords are searched in chief complaint, admit reason, and triage note data fields



# Data Summary

- Scooter and e-bike injuries are higher during the warmer months
- The number of scooter and e-bike injuries are increasing, year-over-year

# Limitations

- Does not capture injuries treated outside of NYC EDs
- Lacks specificity on device types
- Does not account for other device types

# Broader use of syndromic surveillance for road injuries and next steps

- Nationally, the Centers for Disease Control and Prevention created syndromes for:
  - [Pedestrian Motor Vehicle Traffic Injury](#)
  - [Motor Vehicle Crash Occupant Injury](#)
- NYC Health Department is expanding its micromobility syndrome definition to include more device types

# Acknowledgements

- Pierre Amiel
- Ramona Lall
- Anna Caffarelli
- Catherine Stayton
- Josephina Matteson
- Rob Viola