

Where Do 911 System Ambulances Take Their Patients?

**Differences Between Voluntary
Hospital Ambulances and
Fire Department Ambulances**



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EXECUTIVE SUMMARY

BACKGROUND

The New York City Fire Department operates the 911 emergency medical system and is responsible for dispatching ambulances. When someone calls 911, the Fire Department dispatches either its own ambulance or one that is operated by or for a private, not-for-profit ("voluntary") hospital. In recent years, the Fire Department has made greater use of voluntary hospital ambulances. Between fiscal years 1998 and 2000, the Fire Department assigned 65 percent more 911 shifts to voluntary hospital ambulances, rather than to Fire Department ambulances.

Each voluntary hospital must agree to operate its ambulances in accord with Fire Department protocols and must also meet State requirements and obtain a State operating certificate. State and City regulations mandate that ambulances, in all but exceptional circumstances, must transport patients to the nearest appropriate hospital. Exceptional circumstances include conditions that require highly specialized care (e.g., severe trauma) and what is known as the Ten Minute Rule. Under that rule, when a patient asks to be taken to a different hospital, the ambulance crew can accept the patient's request, but only if the alternate destination is not more than ten minutes further than the nearest hospital. However, if there is an immediate, critical threat to the patient's life (e.g., cardiac arrest or unmanageable airway), the ambulance must go to the nearest hospital, regardless of the patient's preference.

Violations of those regulations put patients at risk when a trip takes longer than necessary and/or when they could be taken to a more medically appropriate hospital.

OBJECTIVE AND METHODOLOGY

The purpose of this study was to determine whether patients are brought to the nearest appropriate hospital. We looked at the following: (1) whether under similar circumstances, voluntary hospital ambulances take patients to the same hospitals as Fire Department ambulances or whether they steer them to their own hospitals, (2) whether patient health is put at risk, and (3) whether there is a financial impact on public hospitals.

The primary data for this study comes from the Fire Department's Emergency Medical Service Computer Assisted Dispatch system. The Fire Department provided information on all ambulance transports between May and September 1999. During that period there were 336,842 transports. Using this data, we compared the destinations of patients who were picked up in the same zip code by different providers. We concentrated on 11 zip codes that contain an

HHC facility, but we also performed analyses covering other zip code areas. We took into account the patients' medical condition and the services available at each hospital, and examined maps of where the various hospitals are located.

When an ambulance goes out of its way to bring a desirable patient to its sponsoring hospital, bypassing a closer or more appropriate hospital, we call that "steering." When an ambulance goes out of its way to bring an undesirable patient to an HHC hospital, bypassing its own closer sponsoring hospital, we call that "dumping". In this report, we determine whether or not "steering" and "dumping" occur.

One of the ways in which we determine whether "steering" and "dumping" occur is to compare the destinations of voluntary hospital ambulances with those of Fire Department ambulances. We analyze whether, in similar circumstances, voluntary hospital ambulances take patients to the same hospitals as Fire Department ambulances. Since Fire Department ambulances have no business interest in taking their patients to one hospital or another, they provide a useful benchmark for evaluating the actions of the voluntary hospital ambulances. The bigger the differences in the destinations of voluntary hospital ambulances and Fire Department ambulances, the greater the likelihood that voluntary hospital ambulances are engaged in patient "steering" or "dumping."

We have no direct information on what any patients told the ambulance drivers when they were picked up, but patient choice would not account for differences between the destinations of Fire Department and voluntary hospital ambulances. There is no reason to believe that more patients are reluctant to tell the Fire Department ambulances that they do not want to go to HHC hospitals. In other words, patient choice would be reflected in the destinations of both Fire Department and voluntary hospital ambulances. Furthermore, our findings are similar for unconscious patients who presumably could not express a preference, and for patients in cardiac arrest, in which case protocol requires that the patient be taken to the nearest hospital regardless of preference.

A limitation of our study is that we have no data on patient outcomes. In some of our analyses, we conclude that there is a potential risk to patients by not being taken to the nearest appropriate hospital. However, we have no data on any patient's actual medical condition, and therefore cannot know whether any individual patient was actually harmed by such a practice.

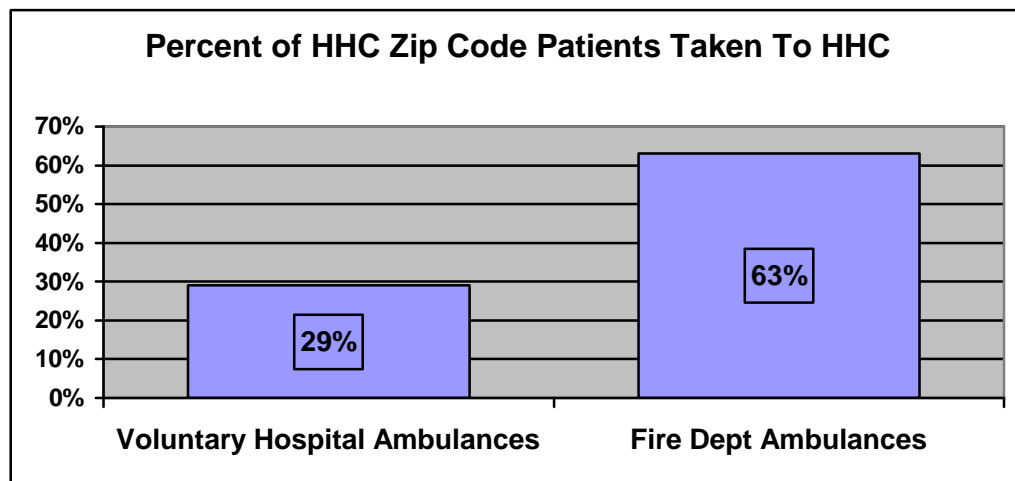
MAIN FINDINGS WITH KEY EXAMPLES

VOLUNTARY HOSPITAL AMBULANCES "STEER" PATIENTS AWAY FROM OTHER HOSPITALS AND TOWARD THEIR OWN

- When voluntary hospital ambulances pick up patients in the zip code area of an HHC hospital, they are less than half as likely as Fire Department ambulances to bring them to the HHC hospital.

Who Picks Up Patient: Voluntary hospital ambulances
Where: In any of the 11 HHC zip code areas
Comparison: Voluntary hospital vs. Fire Department ambulances
Analysis: Who goes to an HHC hospital
Outcome: Voluntary hospital ambulances are less than half as likely as Fire Department ambulances to go to an HHC hospital.

The following table combines the information for all patients picked up in all 11 HHC zip code areas. It shows that voluntary hospital ambulances are less than half as likely as Fire Department ambulances to transport patients from HHC zip codes to the HHC hospitals located within the respective zip code areas. From those 11 zip codes, voluntary ambulances transported 1,749 patients of 6,106, or 29 percent, to HHC. From the same areas, FDNY ambulances delivered 18,756 of 29,909, or 63 percent.



A) Example: Bellevue hospital zip code area.

When voluntary hospital ambulances (New York Hospital, Cabrini, St. Clare's, etc.) pick up patients in the zip code area of Bellevue Hospital, they bring them to Bellevue only 25 percent of the time, as compared to the Fire Department, which does so 61 percent of the time.

Destination of Patients Picked Up In The Bellevue Hospital Zip Code Area

Destination	All Voluntary Hospital Ambulances	Fire Department Ambulances
Bellevue Hospital (HHC)	25%*	61%**
Any Voluntary Hospital	75%	39%

*157 taken to Bellevue/632 total. **815 taken to Bellevue/1,346 total

B) Example: Elmhurst hospital zip code area.

When voluntary hospital ambulances (e.g., St. John's and North Shore at Forest Hills) pick up patients in the zip code area of Elmhurst Hospital, they bring them to Elmhurst only 36 percent of time, as compared to the Fire Department, which does so 79 percent of the time.

Destination of Patients Picked Up In The Elmhurst Hospital Zip Code Area

Destination	All Voluntary Hospital Ambulances	Fire Department Ambulances
Elmhurst Hospital (HHC)	36%*	79%**
Any Voluntary Hospital	64%	21%

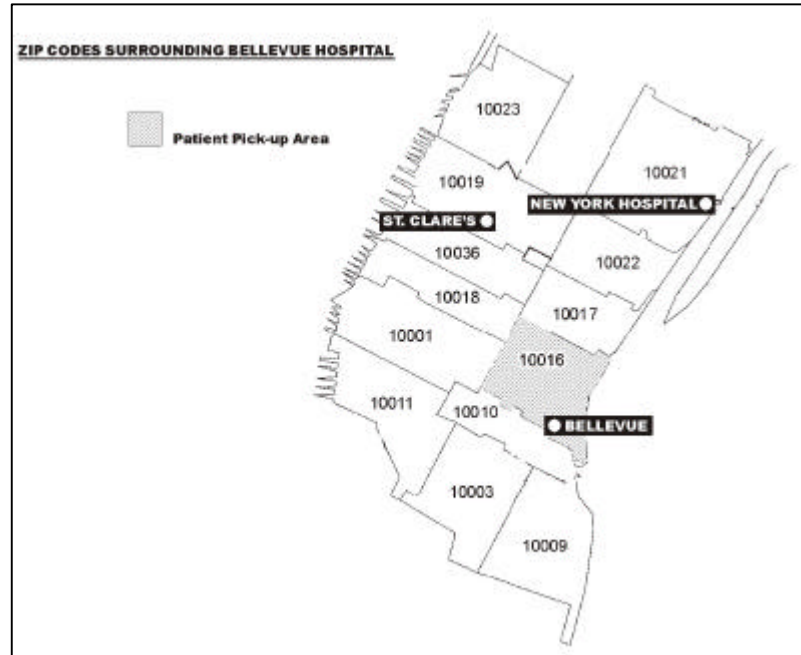
*160 taken to Elmhurst/446 total. **1,264 taken to Elmhurst/1,610 total.

- **When a voluntary hospital ambulance picks up a patient in the zip code area of an HHC hospital, it is far more likely than the Fire Department to bring the patient back to the specific voluntary hospital that sponsors that ambulance.**

Who Picks Up Patient: Voluntary hospital ambulances
Where: In HHC zip code areas
Comparison: Voluntary hospital vs. Fire Department ambulances
Analysis: Who is most likely to bring patients to the voluntary hospital that sponsors the ambulance
Outcome: Voluntaries are far more likely to go back to their sponsoring hospitals. In the examples we cite, "far more" ranges from "ten times more likely" to "25 times more likely".

A) Example: New York Hospital ambulances.

New York Hospital ambulances are 10 times more likely than Fire Department ambulances to take patients picked up in the Bellevue Hospital zip code area (10016) back to New York Hospital. As illustrated in the following map, New York Hospital is three miles from Bellevue. New York Hospital takes 29 percent of the Bellevue zip code patients to New York Hospital, while the Fire Department takes only 3 percent of those patients to New York Hospital.



B) Example: St. Clare's Hospital ambulances.

St. Clare's Hospital ambulances are 25 times more likely than FDNY ambulances to take patients picked up in the Bellevue zip code area back to St. Clare's. As illustrated in the preceding map, Bellevue is on the east side of Manhattan and St. Clare's Hospital is on the west side. St. Clare's takes 55 percent of patients from the Bellevue zip code area to St. Clare's, while the Fire Department takes only two percent of them to St. Clare's.

Destination of Patients Picked Up In The Bellevue Hospital Zip Code Area

Destination	St. Clare's Hospital Ambulances	Fire Department Ambulances
St. Clare's Hospital	55%*	2%**
Another Hospital	45%	98%

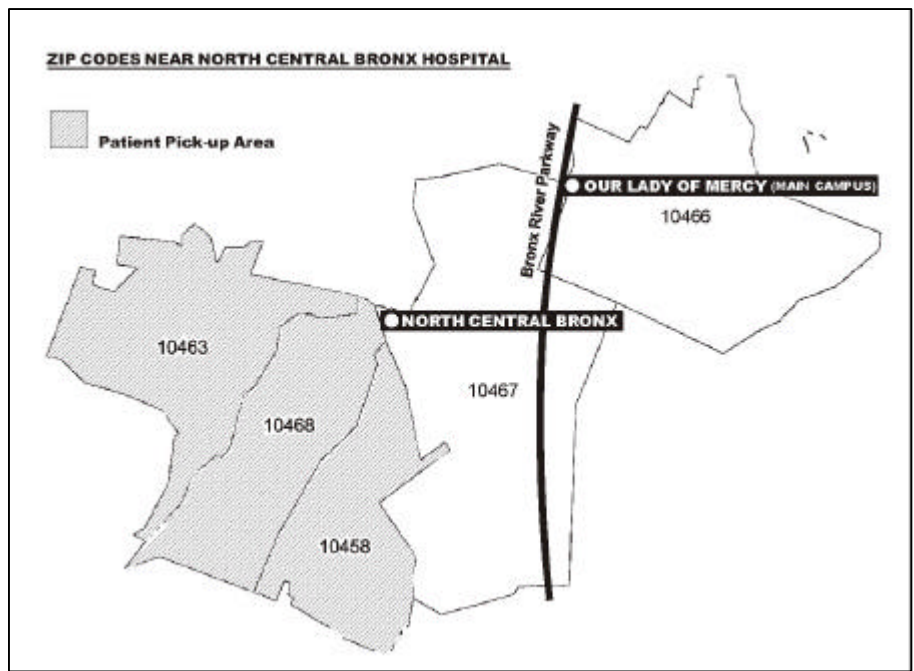
*102 taken to St. Clare's/184 total. **34 taken to St. Clare's/1,366 total

- Some voluntary hospital ambulances bring patients to their sponsoring hospitals even when they cannot get there without passing by a closer HHC hospital.

A) Example: Our Lady of Mercy Hospital ambulances.

Who Picks Up Patient: Our Lady of Mercy ambulances
Where: From any of the 3 zip code areas west of North Central Bronx Hospital (an HHC hospital)
Comparison: Our Lady of Mercy vs. Fire Department ambulances
Analysis: Who bypasses North Central Bronx Hospital to take patients to Our Lady of Mercy Hospital
Outcome: In the three zip code areas, Our Lady of Mercy ambulances are 16.4 times, 8.6 times, and 10.6 times more likely, respectively, to bypass North Central Bronx Hospital.

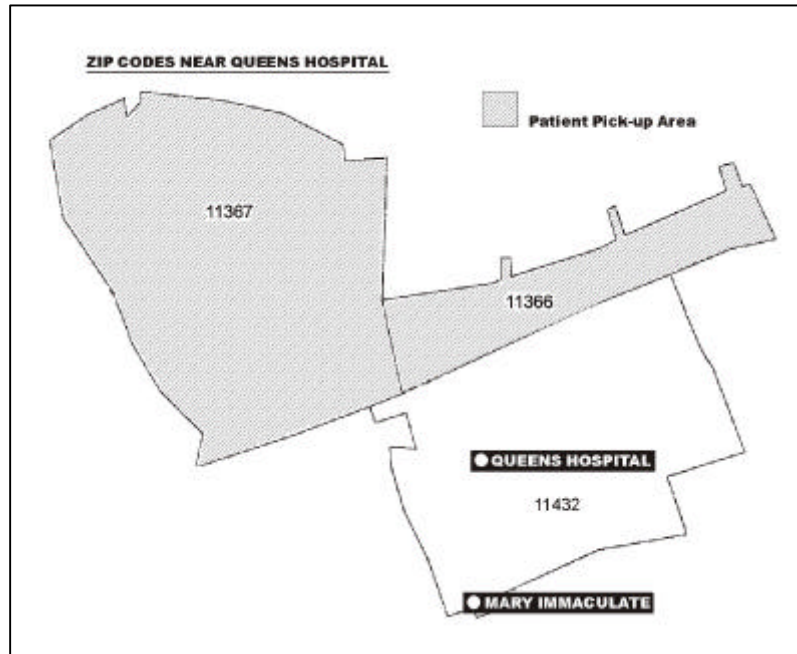
As shown in the next map, Our Lady of Mercy Hospital is located east of the Bronx River Parkway, and North Central Bronx Hospital is located west of the Bronx River Parkway. Some of Our Lady of Mercy’s ambulances cross the Bronx River Parkway and pick up patients even further west, in the three zip code areas west of North Central Bronx Hospital. When they pick up patients in those zip code areas, they have to pass North Central Bronx Hospital in order to bring them to Our Lady of Mercy. In one of the three zip code areas (10468), Our Lady of Mercy hospital ambulances are 16.4 times more likely than Fire Department ambulances to bypass North Central Bronx, and bring the patients back to Our Lady of Mercy. In the other two zip code areas (10458 and 10463) Our Lady of Mercy Hospital is 8.6 and 10.6 times more likely to do so, respectively.



B) Example: Mary Immaculate Hospital ambulances.

Who Picks Up Patient: Mary Immaculate ambulances
Where: From either of 2 zip code areas north of Queens Hospital (an HHC hospital)
Comparison: Mary Immaculate vs. Fire Department ambulances
Analysis: Who bypasses Queens Hospital to take patients to Mary Immaculate Hospital
Outcome: In one zip code area, Mary Immaculate ambulances are 38.8 times more likely than Fire Department ambulances to bypass Queens Hospital. In the other zip code area, they are 5.8 times more likely.

The map below shows the location of Queens Hospital and Mary Immaculate Hospital. When Mary Immaculate ambulances pick up patients from the two zip code areas north of Queens Hospital, they have to pass Queens Hospital in order to bring the patient to their own hospital. In the 11367 zip code area, they are 38.8 times more likely to do so than Fire Department ambulances; in the 11366 zip code area, they are 5.8 times more likely to do so.



- **Voluntary hospital ambulances also steer patients away from each other.**

A) Example: St. Vincent's Hospital zip code area.

Who Picks Up Patient: Voluntary hospital ambulances
Where: St. Vincent's Hospital zip code area
Comparison: St. Vincent's Hospital vs. other voluntary hospital vs. Fire Department ambulances
Analysis: Who is more likely to take patients back to St. Vincent's Hospital
Outcome: St. Vincent's ambulances go back to St. Vincent's Hospital 88% of the time; Fire Department ambulances go to St. Vincent's 69% of the time; other voluntary hospital ambulances only go to St. Vincent's 38% of time.

When St. Vincent's ambulances pick up patients from that hospital's zip code area, they take them to St. Vincent's 88 percent of the time. Similarly, when Fire Department ambulances pick up patients in the St. Vincent's zip code area, they take them to St. Vincent's 69 percent of the time. But, when ambulances sponsored by other voluntary hospitals (e.g., Cabrini and St. Clare's) pick up patients in the St. Vincent's zip code area, they go to St. Vincent's only 38 percent of the time. There is no other hospital in the St. Vincent's zip code.

Destination of Patients Picked Up In The St. Vincent's Hospital Zip Code Area

Destination	St. Vincent's Hospital Ambulances	Fire Department Ambulances	Ambulances Operated By Vol. Hospitals Other Than St. Vincent's
St. Vincent's Hospital	88%*	69%**	38%***
Another Hospital	12%	31%	62%

*753 taken to St. Vincent's/859 total **1,334 taken to St. Vincent's/1,935 total

***227 taken to St. Vincent's/590 total

B) Example: Jamaica Hospital zip code area.

Who Picks Up Patient: Voluntary hospital ambulances
Where: Jamaica Hospital zip code area
Comparison: Jamaica Hospital vs. other voluntary hospital vs. Fire Department ambulances
Analysis: Who is more likely to take patients back to Jamaica Hospital
Outcome: Jamaica ambulances go back to Jamaica Hospital 91% of the time; Fire Department ambulances go to Jamaica 70% of time; other voluntary hospital ambulances only go to Jamaica Hospital 52% of time.

When Jamaica Hospital ambulances pick up patients near that hospital, they take them to Jamaica 91 percent of the time. Similarly, when Fire Department ambulances pick up patients in the Jamaica Hospital zip code area, they take them to Jamaica 70 percent of the time. But, when ambulances sponsored by other voluntary hospitals (e.g., Mary Immaculate) pick up patients in the Jamaica zip code area, they go to Jamaica only 52 percent of the time. There is no other hospital in the Jamaica zip code.

Destination of Patients Picked Up In The Jamaica Hospital Zip Code Area

Destination	Jamaica Hospital Ambulances	Fire Department Ambulances	Ambulances From Other Vol. Hospitals
Jamaica Hospital	91% (1,006 of 1,104)	70% (162 of 233)	52% (167 of 322)
Another Hospital	9%	30%	48%

C) Voluntary hospitals that operate ambulances versus ones that do not operate ambulances.

Who Picks Up Patient: Voluntary hospitals that operate their own ambulances
Where: In the zip code area of any voluntary hospital
Comparison: Voluntary hospitals that operate their own ambulances versus ones that do not operate their own ambulances
Analysis: Who gets a higher percent of the patients who were picked up from within their own zip code area
Outcome: Voluntary hospital ambulances that operate their own ambulances receive 53% of the patients who are picked up from their own zip code area. Voluntary hospitals without ambulances receive only 23% of the patients picked up in theirs.

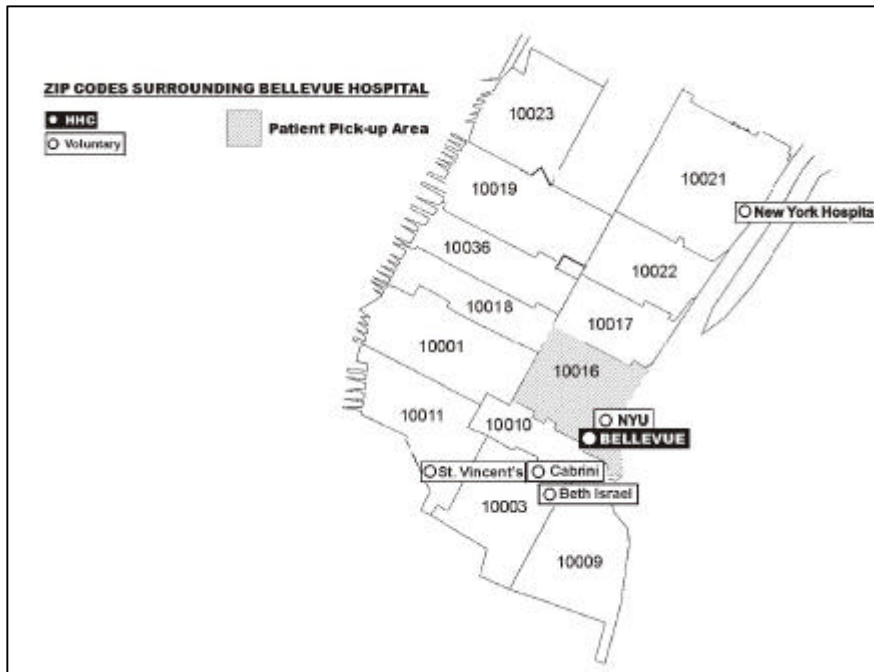
Voluntary hospitals that operate ambulances receive, on average, 53 percent of the patients who are picked up in their own zip code areas, while voluntary hospitals that do not operate ambulances receive only 23 percent of the patients picked up in theirs.

- **Some voluntary hospital ambulances bring patients to their sponsoring hospitals even when they cannot get there without passing by a closer, competing voluntary hospital.**

A) Example: New York Hospital ambulances.

Who Picks Up Patient: New York Hospital ambulances
Where: Bellevue Hospital zip code area (10016)
Comparison: Patients brought to New York Hospital versus patients brought to other voluntary hospitals, which are closer to Bellevue
Analysis: How often do New York Hospital ambulances bring patients to New York Hospital, rather than to other voluntary hospitals, which are closer?
Outcome: New York Hospital ambulances take 29 percent to New York Hospital, but only 14 percent to NYU, and between 2 and 3 percent each to Beth Israel, St. Clare's, and Cabrini.

As shown in the map below, NYU Hospital is next door to Bellevue Hospital. When New York Hospital ambulances pick up patients in the Bellevue zip code area (10016), they not only bypass Bellevue by traveling back to New York Hospital (as discussed earlier), but they also bypass NYU Hospital. In addition, they do not go to other closer voluntary hospitals -- Cabrini, Beth Israel and St. Vincent's. New York Hospital ambulances take 29 percent of these patients to New York Hospital, but only 14 percent to NYU, and between 2 percent and 3 percent each to Cabrini, Beth Israel, and St. Vincent's.

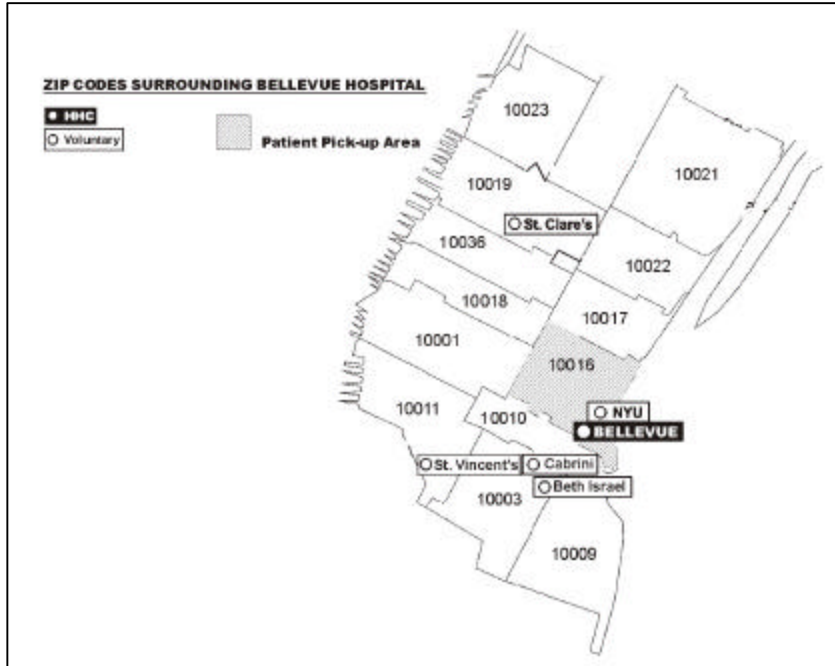


B) Example: St. Clare's Hospital ambulances

Who Picks Up Patient: St. Clare's Hospital ambulances
Where: Bellevue Hospital zip code area (10016)
Comparison: Patients brought to St. Clare's Hospital versus patients brought to other voluntary hospitals, which are closer to Bellevue
Analysis: How often do St. Clare's Hospital ambulances bring patients to St. Clare's Hospital, rather than to other voluntary hospitals, which are closer?
Outcome: St. Clare's Hospital ambulances take 55 percent to St. Clare's Hospital but only 8 percent to NYU, and between 2 percent and 4 percent each to Cabrini, Beth Israel, St. Vincent's.

As shown in the map below, St. Clare's (like New York Hospital in the previous example) is also further away from other voluntary hospitals when its ambulances pick up patients in the Bellevue zip code area (10016). Yet, they not only bypass Bellevue by traveling back to St. Clare's Hospital (as

discussed earlier), but they also bypass NYU Hospital and do not go to Cabrini, Beth Israel and St. Vincent's, which are also closer than St. Clare's. St. Clare's Hospital ambulances take 55 percent of these patients to St. Clare's Hospital, but only 8 percent to NYU and between 2 percent and 4 percent each to Cabrini, Beth Israel, St. Vincent's.



- **In contrast with voluntary hospital ambulance crews, Fire Department ambulance crews show much less preference as to where they take patients. When Fire Department crews pick up patients near a voluntary hospital, they tend to take them to that voluntary hospital.**

A) Example: St. Vincent's Hospital and Jamaica Hospital zip code areas.

Patients are more likely to be taken to a nearby voluntary hospital if the Fire Department transports them than if they are transported by an ambulance that is operated by a different voluntary hospital.

- 1) For example, as discussed earlier (pages viii-ix), when Fire Department ambulances pick up patients in the St. Vincent's zip code area, they take them to St. Vincent's 69 percent of the time. But, when ambulances sponsored by other voluntary hospitals (e.g., Cabrini and St. Clare's) pick up patients in the St. Vincent's zip code area, they go to St. Vincent's only 38 percent of the time.
- 2) Similarly, when Fire Department ambulances pick up patients in the Jamaica Hospital zip code area, they take them to Jamaica Hospital 70 percent of the time. But, when ambulances sponsored by other voluntary hospitals (e.g., Mary Immaculate) pick up patients in

the Jamaica zip code area, they go to Jamaica Hospital only 52 percent of the time.

B) Other voluntary hospital zip code areas.

We found the same pattern in 19 of the 27 voluntary hospital zip code areas we examined. In these zip code areas, Fire Department ambulances were, on average, 50 percent more likely than the other hospitals' ambulances to bring patients to the voluntary hospital that is located in that zip code area. In the other 8 zip code areas, there was either no difference in destinations (5 zip code areas) or the difference was very small (3 zip code areas).

- **“Selective steering” occurs. Voluntary hospital ambulances are twice as likely to steer patients who are insured as patients who are not insured.**

Under no fault automobile insurance, patients with automobile related traumas are automatically insured. Patients with other traumas (e.g., gunshot wounds) are not automatically insured. When voluntary hospital ambulances pick up trauma patients in an HHC zip code area, they are twice as likely to take them back to their own hospital if the traumas are insured than if they are not (54 percent versus 27 percent).

Patients Transported By Voluntary Hospital Ambulances From The Zip Codes of HHC Hospitals: Insured Versus Uninsured

Percent Brought To The Voluntary Hospital That Sponsored The Ambulance		
Insured Traumas (Motor Vehicle Related)	Other Traumas (NOT Motor Vehicle Related)	Ratio
54%	27%	Two to One

A) Example: Bellevue Hospital zip code area.

Who Picks Up Patient: New York/ St. Clare's/ Cabrini Hospital ambulances
Where: Bellevue Hospital zip code area
Comparison: Insured trauma patients vs. uninsured trauma patients
Analysis: Which trauma patients get taken back to New York Hospital
Outcome: Insured trauma patients are taken to New York Hospital 52% of the time. Uninsured trauma patients are taken to New York Hospital only 13% of the time. St. Clare's figures are similar: 50% vs. 20%.

When New York Hospital ambulances pick up trauma patients from the zip code area that includes Bellevue Hospital, they bring their patients to New York Hospital 52 percent of the time when the traumas are automatically insured, but only 13 percent of the time when they are not automatically insured (e.g., patient is stabbed). St. Clare's figures are similar: 50 percent versus 20 percent.

Cabrini, on the other hand, takes a high percentage of all trauma patients, whether insured or not, to Cabrini: 58% versus 50%. This might seem like a "positive finding," insofar as Cabrini is concerned, but it is not. Indeed, under State and Fire Department regulations, major trauma patients are supposed to be taken to the closest trauma center. Cabrini is not a trauma center. Therefore, virtually all of its trauma patients should have been taken to Bellevue, which is the closest trauma center. The same applies to St. Clare's, which is not a trauma center either, and to New York Hospital, which is a trauma center, but is further away than Bellevue.

Patients Transported From The Bellevue Zip Code By A Voluntary Hospital Ambulance: Insured Vs. Uninsured

Ambulance Operator	Percentage Brought to The Voluntary Hospital That Sponsored The Ambulance	
	<u>Insured Traumas</u> (Motor Vehicle Related)	<u>Other Traumas</u> (NOT Motor Vehicle Related)
New York Hospital*	52% (11 of 21)	13% (1 of 8)
St. Clare's Hospital**	50% (6 of 12)	20% (1 of 5)
Cabrini Hospital**	58% (7 of 12)	50% (1 of 2)

*Trauma center

**Not a trauma center

B) Example: Elmhurst Hospital zip code area.

Who Picks Up Patient: North Shore Hospital at Forest Hills/ St. John's Hospital ambulances
Where: Elmhurst Hospital zip code area
Comparison: Insured trauma patients vs. uninsured trauma patients
Analysis: Which patients get taken back to North Shore Hospital at Forest Hills
Outcome: Insured trauma patients are taken to North Shore Hospital at Forest Hills 56% of the time, uninsured trauma patients only 33% of the time. St. John's figures are similar: 80% vs. 67%.

When North Shore/ Forest Hills Hospital ambulances pick up trauma patients from the zip code area that includes Elmhurst Hospital, they bring

their patients to North Shore/ Forest Hills Hospital 56 percent of the time when the traumas are automatically insured, but only 33 percent of the time when they are not automatically insured (e.g., patient is stabbed). For St. John’s Hospital, there is also a variance, but less significant: 80 percent versus 67 percent.

Of even more concern is the fact that neither of the two voluntary hospitals is a trauma center. Under State and Fire Department regulations, virtually all of their trauma patients should have been taken to Elmhurst Hospital, which is the closest trauma center.

Patients Transported From The Elmhurst Hospital Zip Code By A Voluntary Hospital Ambulance: Insured Vs. Uninsured

Ambulance Operator	Percentage Brought to The Voluntary Hospital That Sponsored The Ambulance	
	<u>Insured Traumas</u> (Motor Vehicle Related)	<u>Other Traumas</u> (NOT motor Vehicle Related)
North Shore/ Forest Hills*	56% (10 of 18)	33% (3 of 9)
St. John’s Hospital*	80% (8 of 10)	67% (2 of 3)

*Neither hospital is a trauma center

- **In contrast with voluntary hospitals, insurance status does not make a difference as to where Fire Department ambulances take their patients.**

A) Example: Bellevue Hospital zip code area.

When Fire Department ambulances pick up trauma patients from the Bellevue Hospital zip code area, they bring essentially the same percent to Bellevue regardless of whether or not the trauma is automatically insured (84 percent versus 82 percent).

B) Example: Elmhurst Hospital zip code area.

In the Elmhurst Hospital zip code area, the corresponding Fire Department numbers are 79 percent for automatically insured trauma patients and 87 percent for other trauma patients.

- **While we did find evidence of steering by voluntary hospital ambulances, we did not find evidence of dumping.**

As defined earlier, steering occurs when a voluntary hospital ambulance travels further to take a patient to its sponsoring hospital, rather than to an HHC or other voluntary hospital. Dumping on the other hand, would occur if a voluntary hospital ambulance traveled further than necessary, to take an “unde-

sirable” patient to a hospital other than its own.

We focused on patients who might be considered “undesirable” either because they were uninsured or because of their medical condition.

A) Uninsured patients (picked up in a voluntary hospital zip code area).

When voluntary hospital ambulances pick up patients in an HHC zip code area, they are twice as likely to bring the patients back to their own hospital if the patients are insured than if they are not insured. However, when they pick up patients in their own zip code area, they bring the majority of them to their own hospital whether or not they are insured: they bring 80 percent of the insured traumas and 63 percent of the other traumas to their own hospitals. Thus, they do not go out of their way to bring the uninsured patients someplace else.

Patients Transported By Voluntary Hospital Ambulances From The Zip Codes Of Voluntary Hospitals: Insured Versus Uninsured

Percent Brought To The Voluntary Hospital That Sponsored The Ambulance		
Insured Traumas (Motor Vehicle Related)	Other Traumas (NOT Motor Vehicle Related)	Ratio
80%	63%	1.27 to one

B) Patients with “undesirable” medical conditions (picked up in a voluntary hospital zip code area).

In order to identify the least “desirable” medical conditions, we first looked at what the voluntary hospital ambulances do when they pick up patients from HHC zip code areas. We identified and selected the three categories of patients that voluntary hospital ambulances are least likely to steer back to their own hospitals – “emotionally disturbed person,” “obstetric with complications” and “obstetric in labor”.

To test for dumping, we then analyzed what the voluntary hospital ambulances do when they pick up these same three categories of patients in their own zip code areas. The assumption was that the patients that they were less likely to steer were also the ones that they would be most likely to dump.

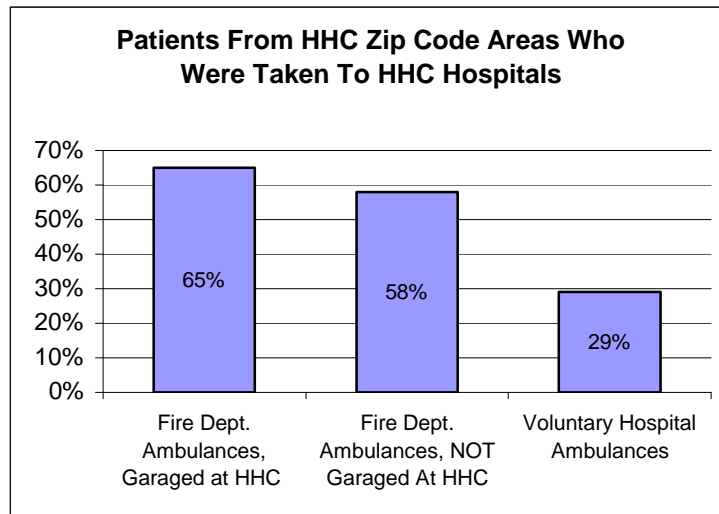
We did not find evidence that voluntary hospital ambulances “dump” these categories of patients. When they pick them up in their own zip code areas, they tend to bring them to their own hospitals, and not to HHC. The main, but justifiable, exception is when the patient needs a service that his or her own hospital does not provide (e.g., a psychiatric ward or a neonatal unit). An-

other factor is that some voluntary hospitals have formal agreements for emotionally disturbed ambulance patients to be taken to HHC. For example, Lenox Hill Hospital negotiated an agreement whereby Lenox Hill's emotionally disturbed ambulance patients are taken to an HHC hospital (Metropolitan), rather than to Lenox Hill.

- **Housing location of FDNY ambulances is not a significant factor.**

At the end of their shifts, crews return their ambulances to a base station, where the vehicle is garaged until it is used on the next shift. About 48 percent of Fire Department ambulance base stations are at HHC hospitals. Some of our sources told us that this might produce a preference for taking Fire Department patients to those HHC hospitals, particularly at the end of a crews' shift. Since they already have to bring their vehicles to those hospitals, they might want to save time by bringing the patients there too.

We analyzed whether a bias exists on the part of Fire Department ambulances in favor of HHC hospitals. We compared the Fire Department ambulances that are garaged at HHC hospitals with those that are not. As shown in the following chart, it does not make much of a difference where a Fire Department ambulance is garaged. Regardless of where the Fire Department ambulances are garaged, they still take HHC zip code area patients to HHC hospitals twice as often as voluntary hospital ambulances.



Note: FDNY at HHC: 13,546 taken to HHC/20,875 total. FDNY **not** at HHC: 5,210 taken to HHC/9,034 total. Voluntaries: 1,749 taken to HHC/6,106 total.

STEERING MAY PUT PATIENTS' HEALTH AT RISK

- Steering may put patients at risk when the trip takes longer than necessary and/or when a patient is not taken to the most medically appropriate hospital. Of even more concern is the fact that steering occurs even when the patient has a life-threatening condition, e.g. cardiac arrest.

Who Picks Up Patient: Voluntary hospital ambulances
Where: HHC zip code areas
Comparison: Fire Department vs. voluntary hospital ambulances
Analysis: Destination of patients with and without life threatening conditions
Outcome: Voluntaries are almost twice as likely to take patients picked up in HHC zip code areas to voluntary hospitals. This holds for life threatening conditions (voluntary hospital ambulances are 1.84 times more likely to take them to voluntary hospitals), as well as for conditions that are not life threatening (voluntary hospital ambulances are 1.95 times more likely to take them to voluntary hospitals).

When voluntary hospital ambulances pick up patients within HHC zip codes, they are almost twice as likely as Fire Department ambulances to bring them to a voluntary hospital, which is often further away. It makes little difference whether or not the patient's condition is life-threatening. Voluntary hospital ambulances are 1.84 times more likely to bring the patients to a voluntary hospital when the patient's condition is life-threatening and 1.95 times more likely when the patient's conditions is not life-threatening.

Patients Transported From HHC Zip Codes

Ambulance Operator	Percent Taken To A <u>Voluntary Hospital</u>	
	Life-threatening Condition*	Not Life-threatening
Voluntary Hospital Ambulances	70% (2,361 of 3,354)	72% (1,996 of 2,752)
Fire Department Ambulances	38% (4,447 of 11,834)	37% (6,706 of 18,075)
Vol. Hosp. Ambulances % Divided By Fire Dept. Ambulances %	1.84	1.95

* Life-threatening calls are those classified by EMS as "segments 1-3".

- **Voluntary hospital ambulances are more likely than Fire Department ambulances to be delayed in getting patients with life threatening conditions to a hospital.** That is because they often take patients from HHC zip code areas to their own, more distant, hospitals, even when the patient’s condition is life-threatening and there is a closer HHC hospital.

A) Ten minute transport time.

Who Picks Up Patient: Voluntary hospital ambulances
Where: HHC zip code areas
Comparison: Fire Department vs. voluntary hospital ambulances
Analysis: Who took longer than 10 minutes to get patients with life threatening conditions to the hospital
Outcome: In 9 of the 11 HHC zip code areas, voluntaries are more likely than Fire Department to take longer than 10 minutes. Percentages vary from area to area.

We compared the ambulances in terms of how often they took more than ten minutes to get patients with life threatening conditions to a hospital. We used more than ten minutes as our criterion for “being delayed” because eighty-five percent of HHC zip code area patients arrive at a voluntary or HHC hospital in less than 10 minutes. The results were essentially the same when we used other criteria (e.g., more than 11 minutes, more than 12 minutes). We did a separate comparison for each of the 11 zip code areas where there is an HHC hospital. In 9 of the 11 HHC zip code areas, voluntary hospital ambulances are more likely than Fire Department ambulances to take more than 10 minutes. As illustrated by the examples below, percentages varied from area to area.

B) Example: Coney Island Hospital zip code area.

In the Coney Island Hospital zip code area, 62 of 170, or 37 percent, of the patients with life threatening conditions take longer than 10 minutes to get to a hospital when a voluntary hospital ambulance transports them, but only 204 of 1,379, or 15 percent, take longer when a Fire Department ambulance transports them.

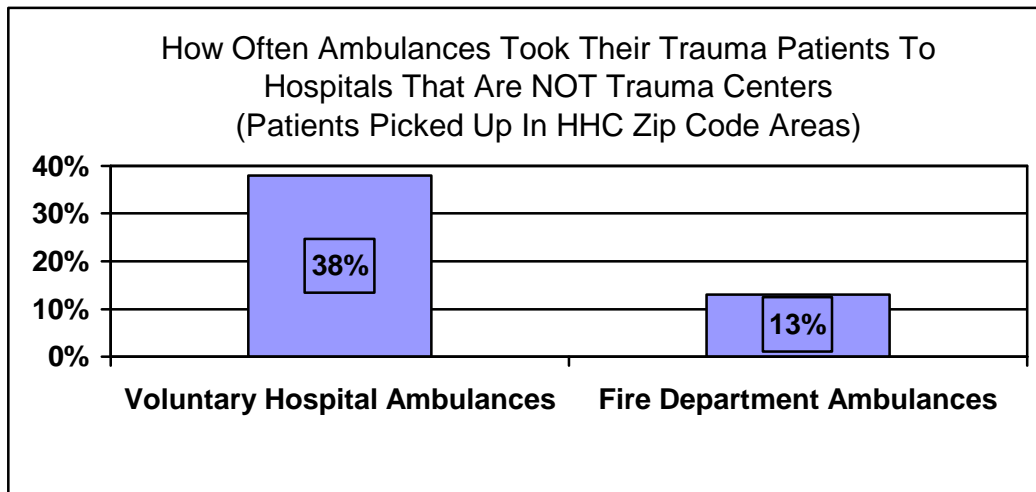
C) Example: Bellevue Hospital zip code area.

Likewise, 76 of 294, or 26 percent, of the patients with life threatening conditions picked up in the Bellevue Hospital zip code area take longer than 10 minutes to get to a hospital if a voluntary hospital ambulance transports them, but only 57 of 424, or 13 percent, take longer when a Fire Department ambulance transports them.

- In the process of “steering,” voluntary hospital ambulances take patients who should be taken to a trauma center to hospitals that are not trauma centers.

Who Picks Up Patient: Voluntary hospital ambulances
Where: HHC zip code areas
Comparison: Fire Department vs. voluntary hospital ambulances
Analysis: How often do voluntaries take trauma patients to hospitals that are not trauma centers?
Outcome: Voluntaries are three times more likely than Fire Department ambulances to take trauma patients to hospitals that are not trauma centers.

Voluntary hospital ambulances are three times as likely as Fire Department ambulances to take trauma patients who were picked up in the zip code area of an HHC hospital to a hospital (usually their own) that is not a trauma center. In those zip codes, voluntary ambulances took 56 trauma patients to a hospital without a trauma center out of a total of 147 transports, or 38 percent. The FDNY did the same with 181 patients of 1,402, or 13 percent.

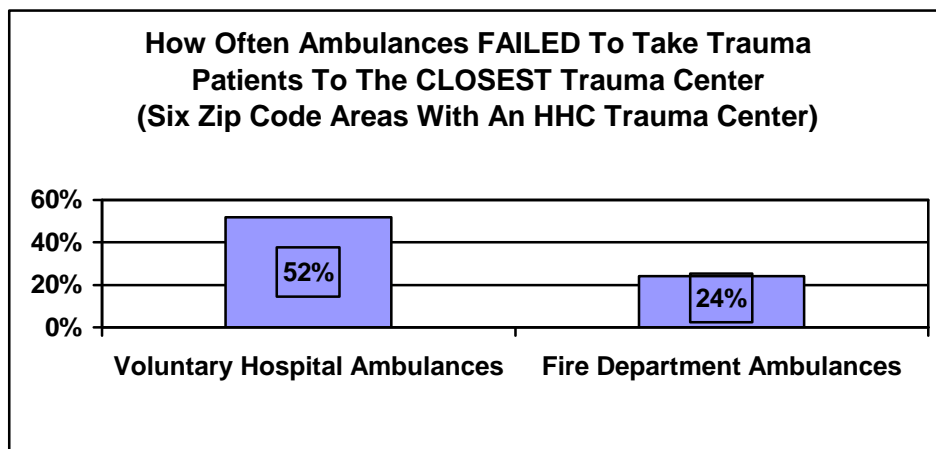


- In the process of “steering,” voluntary hospital ambulances also violate the rule about taking patients to the closest trauma center.

Who Picks Up Patient: Voluntary hospital ambulances
Where: Zip code areas of the six HHC hospitals designated by State DOH as trauma centers and which are also the closest trauma centers
Comparison: Fire Department vs. voluntary hospital ambulances
Analysis: How often do voluntaries violate the rule about bringing trauma patients to the closest trauma center (HHC)
Outcome: Voluntaries are twice as likely as Fire Department ambulances to violate the rule about going to the closest trauma center.

State and Fire Department regulations mandate that trauma patients should normally be taken to the nearest trauma center. The State Health Department has designated six of the HHC hospitals as trauma centers. There are no other trauma centers near these six HHC trauma centers. In these six zip code areas, the HHC hospitals are therefore the closest trauma centers. When an ambulance takes a trauma patient elsewhere, it violates the rule about going to the closest trauma center.

Voluntary hospital ambulances brought 48 percent of the trauma patients from those HHC trauma center zip codes to HHC, and 52 percent elsewhere. By comparison, the Fire Department brought only 24 percent elsewhere. Therefore, the voluntary hospital ambulances were 2.16 times as likely (52 percent versus 24 percent) to violate the rule about going to the closest trauma center.



- When trauma patients are insured, voluntary hospital ambulances are twice as likely to take them to hospitals that are not trauma centers, rather than to closer HHC hospital trauma centers

We did a further analysis of the trauma patients who were picked up by a vol-

untary hospital ambulance in all six HHC trauma center zip codes. We examined the effect of insurance status on being taken to a hospital that is not a trauma center. We found that voluntary hospital ambulances take 45 percent of the insured traumas to a hospital that is not a trauma center, but only 21 percent of the other traumas. Among Fire Department ambulances, there is a much smaller difference (15 percent versus 9 percent).

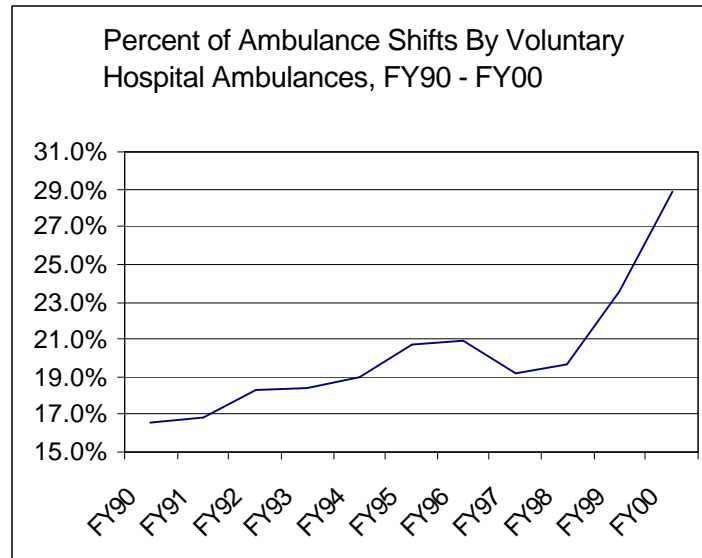
A) Example: St. Clare's Hospital ambulances.

Who Picks Up Patient: *St. Clare's Hospital ambulances*
Where: *Bellevue Hospital zip code area*
Comparison: *Insured trauma patients vs. other trauma patients*
Analysis: *Are St. Clare's ambulances more likely to bypass Bellevue (a trauma center) if the patient is insured versus not insured?*
Outcome: *St. Clare's brings 50% of insured traumas (e.g., no fault automobile accidents) but only 20% of other traumas (e.g., shot, stabbed) to St. Clare's.*

St. Clare's Hospital is not a trauma center. Bellevue Hospital is a trauma center. Under no-fault auto insurance, all automobile-related traumas are insured. When St. Clare's Hospital ambulances pick up trauma patients from the Bellevue zip code area, they bring 50 percent of the automobile related trauma patients but only 20 percent of the other trauma patients (e.g., people who were shot or stabbed) to St. Clare's.

STEERING BY VOLUNTARY HOSPITAL AMBULANCES HAS A NEGATIVE FISCAL IMPACT ON PUBLIC HOSPITALS

- Over the last decade, the percentage of ambulance shifts covered by voluntary hospital ambulances almost doubled, from 16.5 percent of all ambulance shifts in fiscal 1990 to 23.6 percent in fiscal 1999 and 28.8 percent in fiscal 2000.



The increase in the use of voluntary hospital ambulances was associated with a corresponding decrease in the percentage of patients brought to HHC hospitals. In fiscal 1990, 39 percent of all 911 patients were taken to HHC hospitals. By fiscal 1999, the percent had declined to 30 percent (destination numbers for fiscal 2000 were not available at the time of this study).

- Some HHC hospitals lost significantly more ambulance transports than others.

The next table shows that some HHC hospitals lost significantly more ambulance patients than did others, either as a share of all patients transported in their borough and/or in absolute numbers.

Lincoln Hospital was the only HHC hospital that gained ambulance patients. Its share of the Bronx market increased from 18 percent in fiscal year 1990 to 21 percent in fiscal year 1999. In absolute numbers, Lincoln Hospital's transports grew 80 percent (19,628 to 35,375). Notably, the Fire Department does almost all the transports in the Lincoln Hospital zip code area.

In contrast, during the same period, all the other HHC hospitals lost transports, either as a share of the borough total, in absolute terms, or both. The decrease in share was 67 percent at Queens Hospital, 46 percent at North Central Bronx, 27 percent at Harlem, 23 percent at Bellevue and 18 percent at Elmhurst.

Share/ Number of Ambulance Transports Taken to HHC Hospitals						
	Share of Borough Total			Absolute Number		
	FY90	FY99	Change, FY90 to FY99	FY90	FY99	Change FY90 to FY99
HHC HOSPITALS IN QUEENS						
Queens	15%	5%	-67%	16,136	7,677	-52%
Elmhurst	22%	18%	-18%	24,006	26,738	11%
HHC HOSPITALS IN THE BRONX						
North Central Bronx	13%	7%	-46%	14,190	12,444	-12%
Jacobi	26%	19%	-27%	28,373	32,073	13%
Lincoln	18%	21%	17%	19,628	35,375	80%
HHC HOSPITALS IN MANHATTAN						
Harlem	11%	8%	-27%	18,739	14,137	-25%
Bellevue	13%	10%	-23%	21,658	19,126	-12%
Metropolitan	8%	6%	-25%	12,917	11,832	-8%
HHC HOSPITALS IN BROOKLYN						
Kings County	15%	11%	-27%	27,673	26,081	-6%
Coney Island	12%	10%	-17%	22,624	22,593	0%
Woodhull	13%	11%	-15%	24,703	25,155	2%

Source: Fire Department, City of New York

- **The HHC hospitals that lost the most patients were located near voluntary hospitals that operated ambulances.**

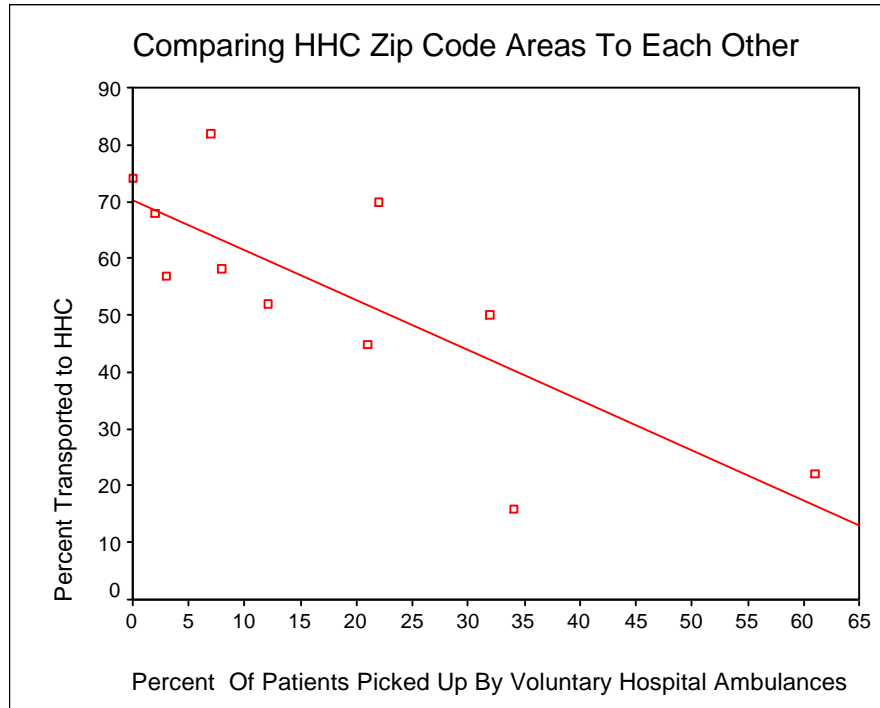
The biggest declines in market share were at North Central Bronx and Queens Hospitals. Both are near voluntary hospitals that operate ambulances (Our Lady of Mercy and Mary Immaculate).

There are 11 HHC acute care hospitals. We categorized the hospitals by whether there is a voluntary hospital in the same zip code area and whether the voluntary hospital operates an ambulance. The average decline in ambulance transport market share was:

- 14 percent at the HHC hospitals that have the zip code area to themselves
- 27 percent at those that share a zip code with a voluntary hospital that does not operate an ambulance, and
- 42 percent at those that share their zip code area with a voluntary hospital that does operate an ambulance.

In addition, voluntary hospital ambulances do a higher percentage of the transports in some of the HHC zip code areas than in others. The percentage

ranges from 61 percent in the Queens Hospital zip code area to less than one percent in the Lincoln Hospital zip code area. As shown in the following graph, in the HHC zip code areas where voluntary hospital ambulances do a higher percentage of the transports, HHC hospitals get a smaller percentage of ambulance patients (correlation of $-.78$).



- **“Patient choice” was not the main reason for some HHC hospitals losing significantly more ambulance patients than others.** Voluntary hospitals that have been successful in competing with HHC for ambulance patients have not been as successful in competing with them for the patients who walk in to the emergency room on their own.

A) Individual HHC hospitals compared to specific competitors.

We compared each HHC hospital with the specific voluntary hospital or hospitals that compete with it for ambulance patients (e.g., we compared Elmhurst Hospital with St. John’s and North Shore at Forest Hills). The competitors that operated ambulances got a bigger share of the local market for ambulance patients than the other competitors, but they did not get a bigger share of the patients who walked into an emergency room on their own, without an ambulance.

B) Change in number transported to HHC by ambulance compared to change in number coming to HHC on their own.

Ambulances overall brought 7 percent fewer patients to HHC hospitals in 1999 than in 1997. But, during this period, there was a 4 percent increase in the total number of patients (ambulance plus “walk-ins”) using HHC emergency rooms. The decline in the number of people coming to HHC emergency rooms by ambulance was offset by an increase in the number coming on their own.

- ***Bottom Line:*** If HHC received the same 39 percent of ambulance transports in fiscal 1999 as in fiscal 1990, it would have gained approximately \$86 million in net inpatient revenue in fiscal 1999.

KEY RECOMMENDATIONS

Our main recommendation is that the Fire Department monitor voluntary hospital ambulances more closely and enforce its policy that ambulances must take patients to “the closest and most appropriate” hospital. Some of the more specific recommendations for the Fire Department are listed below.

- Program the Computer Assisted Dispatch system (CAD) to identify which specific hospitals are the nearest and most appropriate for each transport. Through the dispatch system, direct ambulances to go to those specific hospitals, except where they can provide appropriate justification for going elsewhere
- Audit whether ambulances took patients to the recommended destinations. Routinely gather and analyze statistics on how often ambulances took patients elsewhere. Monitor different areas of the City to see whether there are differences in the destinations of Fire Department ambulances and voluntary hospital ambulances.
- Automate the ambulance call report form in order to secure more timely information on why ambulance crews went to other destinations.
- Verify those explanations, focusing on the providers that most frequently go to alternative destinations.
- Warn the voluntary hospital ambulances that steer patients to end this practice. Send notices of violation to appropriate providers, with copies to other regulatory bodies, including State Health Department officials responsible for hospital surveillance. The notices should include a request for a plan of correction, and a warning about potential sanctions.
- If a provider fails to stop "steering" despite warnings to do so, replace it with a different voluntary hospital's ambulances or with Fire Department units.

- Develop additional methods of sanctioning violators, so that the Fire Department has the option of invoking less severe sanctions when appropriate.