

A Health People Special Report: Ending the Diabetes-COVID Disaster

The Massive Mortality that People with Diabetes in the United States, and Particularly New York City and New York State, Have Suffered During COVID are Significantly Preventable

NYC's 356% Increase in Diabetes Deaths in First COVID Wave was Highest in Nation¹

Overview of Excess, Preventable COVID Diabetes Deaths in New York City, New York State and the Nation

When Loretta Fleming, a South Bronx public housing resident with diabetes, took local self-management classes after years of failed efforts at trying to better control her diabetes, she was able to reduce her A1C (a blood sugar measure) from a near lethal 11% to 6.5%. She knew that by doing this she was slashing her risks for kidney failure, amputation and a range of other diabetes-related complications; what she didn't know is that she was also slashing her risk for the worst outcomes ---including death, ICU stays and ongoing illness---if she contracted COVID. By the time the COVID epidemic emerged, Loretta herself had become a diabetes community educator, helping hundreds of people in the area of the city which would have the city's worst COVID infection rate---and greatest threat for people with diabetes---learn sensible diet changes and other strategies to lower their own blood sugar. But, just as it became clear that COVID was a catastrophe for people with diabetes, Health People's community-delivered diabetes self-management program, where Loretta was an educator, fully lost its federal and state funding and had to close down---a situation of shattering neglect found in the communities most devastated by diabetes and COVID across the nation.

The correlation of pre-existing Type 2 diabetes with COVID deaths is a decisive factor in the COVID disparities which have seen low-income and minority populations ravaged by COVID. **Yet while the correlation between susceptibility to contracting and even dying from COVID and the demographic and economic factors afflicting communities of color and poverty have been widely known, less attention has been paid to the corresponding correlation between Type 2 diabetes and precisely those populations. Major studies, which have reviewed the blood sugar status of more than 11,335 COVID-related deaths of people with pre-existing Type 2 diabetes, now show that deaths—and complications—rose steadily with increasing blood sugar (A1C) levels; but that, for people with diabetes in good control, COVID outcomes are not significantly worse than for COVID patients who don't have diabetes.**

This research makes clear that shocking level of excess COVID deaths seen for people with diabetes, as well as the extra severity of COVID illness they experience, are significantly preventable.

What is particularly striking in the studies is the cumulative evidence that modest blood sugar decreases can provide measurable protection both against people with diabetes dying from COVID and developing severe COVID complications that require intensive hospitalization.²

It has been demonstrated for years that a range of self-management and patient education courses---particularly when they are provided at community sites right in neighborhoods where high need populations with diabetes can access them---regularly help people with Type 2 diabetes drive down their blood sugar **within weeks**. These courses also save significant amounts of medical dollars by reducing hospitalizations and emergency room visits for people with diabetes as well as expensive complications from other diseases, such as heart and kidney disease, which diabetes worsens.³

The stakes in improving health---even while reducing the nation's now overwhelming medical costs---are enormous. The United States has 34 million citizens with Type 2 diabetes; New York State has 2 million and New York City has 1 million; available surveys on population health strongly suggest that between 40 and 50% of people with Type 2 diabetes in these jurisdictions have blood sugar levels that place them at high risk for COVID complications and death and would significantly benefit from direct education to lower their blood sugar. In one major study, 11% of people with diabetes hospitalized for COVID who were in poor blood sugar control died; but only 1% of those in good control died---a devastating difference. The significant reduction in serious COVID complications, including Acute Heart and Respiratory Diseases, with lower blood sugar, is also impressive and important.⁴

In sum, evidence-based self-care education presents an extraordinary opportunity----unique in the COVID epidemic----to measurably decrease COVID deaths as well as the serious complications now seeing hospital systems across the nation overwhelmed by COVID patients requiring intensive care. Diabetes self-care education equally, presents a unique opportunity to lower the extraordinary medical costs for both COVID and diabetes, which are bringing the health care systems to financial collapse.

Yet, in one of the most stunning illustrations not just of systematic racism in the medical system---but the way the American system is designed to underwrite hospitalizations and “procedures’ over prevention---neither Medicaid or Medicare, the national insurers for the low-income and elderly diabetes patients who are most at risk for COVID, will pay for the community-based education that works best.

States and cities absolutely devastated by COVID also continue to refuse to support community-delivered self-care education. New York City had a 356% (!!) increase in excess deaths of people with diabetes in the first wave of the epidemic, the greatest for any area of the nation and New York State's increase was the largest of any state in the first wave.¹ Yet even those devastating increases weren't enough, despite political and public health leaders regularly declaring their deep concern about COVID disparities, to move the city or state to launch coherent, well documented strategies to reduce the devastation of COVID and diabetes.

In the end, having seen their low-income and minority communities suffer most in the first wave of COVID, New York State and City---like multiple jurisdictions around the nation---have now just left the large populations of people with diabetes in these same communities to be unnecessarily vulnerable to more episodes of mass mortality in the second wave.

Diabetes as a Driver of COVID Deaths and Complications: The United States has seen a staggering association of diabetes and COVID deaths, with diabetes reported as a co-factor in almost 40% of deaths nationally in the first five months of the epidemic!⁵ But the situation in New York City and New York State was particularly shocking. **In the first wave of COVID, New York City had had the worst increase in excess deaths of people with diabetes of any major area of the United States---**a 356% increase. New York State's increase in excess deaths of people with diabetes was the largest of any major state!¹ (These excess death studies compare the number of monthly deaths of people with diabetes in the early surge of March and April 2020 to average monthly diabetes deaths over the previous five years ---that is, pre-COVID; in this instance excess diabetes deaths are assumed to include both people with diabetes whose COVID was not diagnosed and people with diabetes whose care was interrupted by the epidemic.)

As the COVID pandemic has continued, diabetes deaths, apart from the deaths of people with diabetes from known COVID infection, continue to be significantly above normal. Overall for the first recognized eight months of the COVID epidemic, diabetes has the highest rate of excess deaths of any chronic condition surveyed.

Between mid-March and mid-November, deaths directly attributed to diabetes were 15% above normal nationally; (these deaths are also assumed to represent a combination of undiagnosed COVID deaths and diabetes deaths that occurred as the epidemic interrupted regular medical care.) In New York City, overall for the same period, even though the city pulled back from the devastating first wave of deaths after April, for the whole period from mid-March to mid-November, deaths for people with diabetes were 24% above normal (in addition to documented COVID deaths of people with diabetes); New York State's diabetes deaths (not counting New York City) were 18% above normal for the same period and New Jersey's were 37% above normal.⁶

The mechanism, which we now understand, of sugar interactions with COVID receptor cells, helps explain this extra vulnerability of people with diabetes. Excess blood sugar (glucose) actually increases COVID receptor cells (known as ACE 2 receptors or portals.) Glucose also seems to crystallize around the opening of the ACE portals so "the higher the blood glucose the more crystallization holding the door open so that the virus actually has an easier entry into cells for infectivity," in the summary of Robert Lustig M.D., a national expert on sugar-induced disease and the founder of Real Food.^{7,8}

At the same time that this special vulnerability helps explain the disaster of diabetes and COVID, it also underscores what multiple studies show lower blood sugar starts to close this door, producing measurable reductions in COVID deaths and complications.

The Major Studies Correlating Rising A1C with Increased COVID Deaths/Poor Outcomes/Complications also Show that Significant Improvements are Possible with Modest A1C Decreases

The two major studies of COVID and A1C levels----one British⁹ and the other from China⁴ which together reviewed 11,335 deaths of COVID-infected people with previously confirmed Type 2 diabetes----both conclude that higher A1C levels were consistently associated with COVID death. (The A1C is a blood test that measures average blood sugar over the previous few months; 5.7-6.4% is the pre-diabetes range

while 6.5% and above starts the diabetes range; 7.5% is widely considered the outer limit of acceptable blood sugar control; 7.6% and above shows increasingly poor control.)

The British study determined that deaths start to measurably rise when people with diabetes have an A1C level of 7.6% and steadily increase with rising A1Cs, doubling for those with A1Cs of 10% or more.⁹

A study of 810 COVID patients with Type 2 diabetes followed at 19 hospitals in China also found significantly increased deaths and complications for patients in poor control compared to those in good control. Patients in poor control had a median A1C of 8.1 % and those well-controlled had a median 7.3% A1C.⁴

Details of Studies:

A. English Population Study of Mortality in 10,525 People with Type 2 Diabetes and COVID Recorded on Death Certificates⁹

In this study of 10,525 people with pre-existing Type 2 Diabetes hospitalized with COVID, A1C levels of 7.6 and above showed a steady, step-by-step increase in mortality; equally, it was clear that even modest reductions in A1C could provide measurable protection against death.

This chart summarizes the British findings for 10,525 hospitalized patients with diabetes and COVID:

A1C	Excess Deaths per 100 Patients	Hazard Ration (Reference A1C)
6.5 – 7		1
7.1 – 7.5	5	1.05
7.6 – 8.9	22	1.22
9.0 – 9.9	36	1.36
10+	61	1.61

In brief, a significant increase in deaths started in the 7.6 to 8.9 range and deaths then almost triple for people with A1C levels of 10 or more. At the same time, even a reduction of A1C to 7.5 – the upper range of “good control”, can slash the risk of death.

B. Chinese study examining deaths and a range of complications for 810 COVID patients with Pre-existing Type Two Diabetes admitted to 19 hospitals.⁴

The study compared outcomes for patients considered in good control (282) and those considered in poor control (582). The good control patients had a mean A1C of 7.3% while the poorly controlled group had a mean 8.1% A1C.

The death rate in this study was only 1.1% for the well-controlled group versus 11% for the poorly controlled group!

Equally important, the study compared a range of complications and the need for medical interventions in the two groups. Some examples are:

Diabetes Patients in Hospital	Well-Controlled Median A1C 7.3%	Poorly Controlled Median A1C 8.1%
Inhaled Oxygen	70.2%	83.5%
Non-invasive Ventilation	4.6%	11.9%
Invasive Ventilation	0	4.2%
Septic Shock	0	4.7%
Acute Respiratory Disease	7.1%	21.4%
Acute Heart Injury	1.4%	9.9%

(Important note: This study excluded patients older than 75 years, meaning these deaths and complication rates with higher A1Cs stand out as occurring in age groups generally expected to have better COVID outcomes.)

In conclusion, the study authors observed that “compared to individuals with well-controlled blood glucose, poor glycemic control in individuals with pre-existing Type 2 diabetes was associated with worse outcomes involving increased need for medical interventions, multi-organ injuries and higher mortalities.”⁴

National, New York City and New York State Population A1C levels Place Millions of People with Diabetes in the Documented COVID High Risk Zone

New York City, New York State and National A1C Levels highlight Both the Widespread Risk for Poor COVID Outcomes---And Real Potential to Protect People with Diabetes. On the one hand, available data suggests that more than 40% of people with diabetes across the United States and 40 to 50% in New York State and City have A1Cs of 7.6% or more, the level at which risk for COVID death seems to significantly increase. On the other hand, literally millions of people with diabetes are in a range where modest drops in A1C of 1% to 2%, which it has been repeatedly shown many can achieve through focused self-management education, would provide significant protection against poor COVID outcomes.

In the Centers for Disease Control’s most recent (2018) annual projection for the nation’s 34 million diabetics, almost half of people sampled have A1C levels of 7% or above, including 22.3% with a level of 7.0 to 7.9%; 13.2% with a level of 8.0% to 9.0%; and 14.6% above 9%.¹⁰

New York State has an estimated 2 million adults with diabetes. Statewide A1C levels are not publicly available (showing the state’s astounding disinterest in even planning for diabetes control); however, available data from Health Management Organizations (HMOs), which provides measures of A1Cs above and below 8%, show that 39% of New Yorkers with diabetes receiving care through commercial HMOs have A1Cs of 8% or more, as do 40% of people with diabetes in Medicaid HMOs.¹¹

New York City has some one million adults with diabetes; in the most recently available public report on New York City A1C levels (which, reflecting the city's own disinterest in even tracking diabetes, is from 2012) those tested had an average A1C of 7.8%; 13.4% had an A1C of 8 to 9%; with another 16.9% were in very poor control with A1Cs of 9% or more.¹²

Since none of these governments report A1Cs in detail, level-by level, it is not possible to directly project what portion of these diabetic populations are at the higher risk level of 7.6% and above; however, it certainly appears that in every jurisdiction, at least 40 to 50% of citizens with diabetes are at this higher risk for COVID death and complications, and would directly benefit from education and information.

From Lethal Neglect to Widely Saving Lives and Massively Saving Money

There is already a range of well-proven strategies, perfectly well-known to the federal government and to Health Departments, that could have been immediately used to give people with diabetes the chance to achieve better control to protect themselves. Multiple self-management courses and protocols, especially those delivered in community settings where they are accessible to the people who need them, have been well evaluated to measurably help people with Type 2 diabetes reduce their A1C levels **within weeks**. A major review of multiple different self-management courses implemented in community settings (such as churches, community centers, etc.) found that participants achieved an average 1.9% A1C reduction---a reduction which would clearly reduce COVID risks for very large numbers of people in both New York State and City with blood sugar levels that now place them at higher risk for COVID complications and death.³

Yet, the New York State and City Health Departments, and others across the nation, just continue to leave people with diabetes vulnerable to more episodes of avoidable mass mortality in a COVID "second wave." As noted, neither Medicare nor Medicaid will pay for the community-delivered self-care education that is most effective at reaching the low-income and minority people with diabetes who are most at risk for COVID. The Centers for Disease Control website for information on conditions that pose extra risks for COVID illness, which should be a major source of helpful COVID information, does not once mention the life-saving benefit of better blood sugar control in its discussion of COVID and diabetes.

Neither New York City or New York State spend any funds at all on making the multi-session patient education courses best shown to help people control blood sugar available in poor communities with high diabetes rates; to the contrary, in April 2020, the New York State Department of Health completely withdrew funding from the little existing community-based education available in low-income communities just as it was becoming starkly clear that uncontrolled diabetes was fueling COVID deaths.

Equally, while a COVID second wave has already overwhelmed many hospital systems---and threatens to overwhelm more--- the public health establishment, in ignoring concentrated initiatives to improve blood sugar control, is completely ignoring a major and immediately available strategy to reduce unnecessary hospitalizations, complications and ICU stays for people with diabetes who do contract COVID. People with diabetes in good control have impressively slashed rates of a range of complications from COVID. This means that focused efforts to widely reduce blood sugar would not only

reduce hospital usage but strongly suggest that reducing blood sugar is a leading strategy to start preventing “long-hauler” complications that keep people sick for months (and perhaps years) after COVID. Acute respiratory and heart diseases during COVID illness---two of the complications that decrease most as blood sugar levels decrease---are strongly associated with debilitating continuing illness from COVID.⁴

The savings to states and the federal government in public health expenditures would also be enormous. New York State’s excess Medicaid diabetes costs, for one example, now amount to \$13.4 billion a year. They are the highest in the nation and a major source of the state’s \$4 billion Medicaid deficit. (Excess Medicaid diabetes costs are defined by the Centers for Disease Control and Prevention as the extra annual cost per Medicaid patient with diabetes, compared to the annual cost for others on Medicaid.) These excess costs are driven by complications like diabetes-related blindness, kidney disease and amputations, which alone have soared by 48% in the state in the past decade. Adding up surgery, prosthetics, pain management, physical therapy and related interventions, one above-the-knee amputation can easily cost \$250,000 in the first year alone.¹⁴

These severe complications, and multiple other costs, are---like the worst COVID outcomes---substantially preventable with proper clinical care and, especially, with effective patient education.

The federal government pays 57% of all New York Medicaid expenditures while the state pays 33% and the city and other counties pay the remaining 10%.

Evaluation of the Diabetes Self-Management Program (DSMP), a six-session small group course in self-management for people with Type 2 diabetes, shows that in the year after participating in it, patients had \$2,220 lower “all-cause” medical costs (i.e., fewer hospitalizations, emergency room visits, diabetes complications and complications from other diseases, like heart and kidney disease which diabetes worsens. Particularly impressive is that a year after the DSMP, participants with Type 2 diabetes have 90% fewer new diagnoses of kidney disease, which saves them from the personal atrocity of regular dialysis while saving the public the some \$90,000 a year which dialysis now costs in New York.)¹⁵

But it only costs about \$900 a participant to provide the DSMP; if New York State enabled local groups in high risk communities to start providing the DSMP locally and these groups enrolled even 20% of New York’s some 900,000 Medicaid patients with Type 2 diabetes in the DSMP, the resulting savings would amount to almost \$400,000,000 in just the first year, with the federal, state and city governments all having shares!^{10,14}

People with diabetes are so anxious to learn self-management that our own Bronx organization, Health People, enrolled almost 2,000 people on Medicaid in the Diabetes Self-management Program using special federal funding, known as waiver funding, which is administered through states. The federal funding ended in April 2020, just as it the terrible role of diabetes in COVID deaths was becoming clear; and the state health department seized funding which had been slated to continue this diabetes self-management program for another year, leaving the Bronx without any community-delivered diabetes self-care education at all.

It is hardly a coincidence that the Bronx, where diabetes is the worst in the state, also experienced the state’s highest rate of COVID deaths.

Yet, now added to the multi-millions in savings in diabetes costs would be further multi-millions in savings for the significantly avoided hospitalizations and ongoing complications that education on improved blood-sugar control provides when diabetics contract COVID.

Conclusion: As one expert diabetes clinician has clearly and simply stated, “even small improvements in blood sugar significantly reduce diabetes-related risks for these (COVID) patients.”

But, there is no national, state or city effort to provide the basic patient education, holistic clinical care and effective policy reform directed at achieving the modest reductions in blood sugar that could guard a large portion of Americans with diabetes against the worst COVID complications and outcomes. It is hard to think of any similar occurrence in modern public health where key information that so basically guards people’s lives---and would also benefit overwhelmed health systems – has not propelled a proper public health information and education campaign. It is a situation that outrightly defines what is meant by “systematic racism”---an entire system that deeply hurts people’s lives and now survival.

The many statements of New York City and State political and health leaders that they are concerned about the disparities seen in the impact of COVID, and especially concerned about the low-income and minority communities who have suffered the most, simply are not credible.

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About Health People: Health People, Community Preventive Health Institute in the South Bronx was founded in 1990 as a women’s AIDS peer education program. Health People has gone forward to use its powerful peer model to fight AIDS, diabetes, asthma and other chronic disease by entirely training people from the community to deliver evidence-based prevention and self-care services.

Chris Norwood, its founder and Executive Director, is a nationally recognized leader in community-based and peer-delivered health services. She has published extensively on health, including writing the first national article on women and AIDS. She was named a Crain’s New York Notable Woman in Health Care in 2018 and 2019 and in 2005 was chosen for a special Nobel peace Prize nomination honoring 1,000 women from around the world for their local work.

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