

# A New Look at Inequality: Introducing and Testing a Cross-Sectional Equality Measurement Framework in New York City

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**Abstract** Inequality is a characteristic of societies worldwide, and many groups face disparities across a range of domains from economy to health to justice. While inequality is a complex problem in which many of these domains are interconnected, most research examines only one area, or at most the effect of one area on another. This paper details an innovative approach to studying inequality using an indicators methodology. The Equality Indicators are comprised of 96 measures of inequality and how it changes annually across six themes: Economy, Education, Health, Housing, Justice, and Services. It compares the experiences of those most likely to be adversely affected by inequalities to those of less disadvantaged groups. Here, we detail the development of the tool, its structure, data sources, and scoring system, followed by baseline findings from New York City, where we combined administrative and secondary public survey data with the data from a new public survey conducted for this study. We found substantial inequalities across all six themes, although they were most pronounced in Health and Justice. While we are not able to make direct comparisons of indicators in a given year, the intention of the tool is to track change over time; in future years we will be able to compare change or lack thereof across indicators and domains. The current findings across areas, however, suggest that New York City is characterized by vast inequalities, where disadvantaged groups are twice as likely as others to experience negative outcomes in fundamental areas of life.

**Keywords** Equality · Indicators · Disadvantaged groups · Measurement

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Equality is not a new topic and inequality is not a recent problem. Philosophers, legal scholars, economists, social scientists, urban planners, educators, health professionals, human rights activists, and international development experts have long spoken about its causes, variations, and consequences (see e.g., Atkinson 2015; Stiglitz 2012). Yet a recently revived interest in equality—partially triggered by popular politics and a widening gap between the top and bottom—cannot go unnoticed. A quick search for “equality” yields topics ranging from gender inequality, more commonly applied globally, to racial and ethnic inequality, immigration inequality, and marriage inequality in America. The severity of gender inequality, and the growing appetite for measuring and incentivizing change, has triggered extensive discourse and numerous initiatives, ranging from the gender-wage-gap debate (Institute for Women’s Policy Research 2015) to more sophisticated indices such as the United Nations (UN) Development Programme’s Gender Inequality Index. While there is some evidence of improvement in specific regions of the world (Ortiz and Cummins 2011), and even globally by some metrics (Milanovic 2013), most evidence points to increasing within-country inequality and high levels of inequality globally that are stable or on the rise (Ferreira and Ravallion 2008; Milanovic 2013; Ortiz and Cummins 2011).

Prominent in the United States are stories about the on-going struggle of racial and ethnic minorities and inconsistencies between America’s egalitarian ideals and its history of racial discrimination (Alexander 2010). Inequalities among racial and ethnic groups remain immense in almost every field, including education, health, and criminal justice, and despite a handful of promising developments in recent history—the election of Barack Obama being one of them—the end to the race struggle in America is not yet in sight. The equality of opportunities is also captured by the immigration debate and by the debate over same-sex marriage, as even after the legalization of same-sex marriage by the Supreme Court (*Obergefell v. Hodges* 2015), some same-sex couples are still being denied their right to marry (e.g., Blinder and Lewin 2015).

As discussed in the sections that follow, a significant body of writing on equality has accumulated over the years, including philosophical, historical, and legal analyses. When equality is put to the test empirically, however, researchers tend to focus on one or at most two of its aspects, whether it is equality in wages, unemployment, mortality, or how race impacts graduation rates, which makes it difficult to develop a holistic picture of equality. This paper presents the result of a multi-year effort to rethink how equality should be defined and measured in a contemporary urban setting in a way that can help government agencies, policy groups, civil society, and academic institutions develop specific projects, policies, and practices to ameliorate or slow the progress of certain inequalities.

The Equality Indicators tool described herein captures 96 issues of Economy, Education, Health, Housing, Justice, and Services using various administrative datasets, secondary public survey data, and a survey conducted specifically for this project. The indicator methodology is being increasingly used to measure progress towards specific goals, especially hard-to-measure concepts such as well-being, transparency, and accountability, that often necessitate grouping a set of measures (Kutateladze and Parsons 2014; Vera Institute of Justice 2003). The methodology for the Equality Indicators includes aggregating quantitative information at several levels and tracking change over time. Alongside our methodology, here we also present the baseline findings from the application of this tool in New York City (NYC). In this way, we offer an opportunity to help the city’s new administration to fulfil its commitment to measuring and addressing the city’s growing inequality (Cronkite 2015) by pinpointing specific types of inequalities and where policy changes are most needed. As America becomes more ethnically

and culturally diverse, opportunities for creating new inequalities also diversify. This framework reflects the growing heterogeneity of American cities and NYC is an ideal setting for testing it.

## 1 Background

### 1.1 Four Conceptions of Equality

The equality discourse traces its roots to classical antiquity and, since then, it has shaped four distinct conceptions: moral, legal, political, and social (Johnston 2000); all four of these conceptions of inequality are integrated into the proposed tool. *Moral equality* implies that all humans—regardless of their race, gender, or social status—should have equal worth and be given the same resources. While this argument may not always be practicable (e.g., not enough emergency housing exists to house all homeless families), it does apply to some areas. For example, teaching literacy to 10 children instead of molding one outstanding scientist (at the expense of depriving the nine others of any training) will improve the living conditions of a greater number of people.

*Legal equality* refers to the presence of statutes insuring equal treatment, or the absence of statutes enabling or encouraging discrimination (e.g., the absence of laws denying women the right to vote or laws defining marriage as between a man and a woman). Legal equality also refers to the equal application of the law to people from different groups and to all types of crimes, especially when the exemption from punishment is motivated by non-legal characteristics. The criminal justice system's failure to detect and punish white collar crimes at the same rate as robberies and burglaries would be inconsistent with legal equality, as would racial and socioeconomic disparities at arrest or sentencing.

*Political equality* is about giving all residents the right to shape their city's and country's political and social future through the inclusive democratic practices of elections, referenda, and participatory budgeting. While in today's America, laws no longer explicitly deny voting rights based on gender or race, many Americans still cannot vote because of problems with voter registration, inaccessibility of polling stations for individuals with physical disabilities, or disenfranchisement triggered by criminal conviction, among other reasons. Political equality also extends beyond one's ability to vote, and do so without intimidation and harassment, and it should apply to the availability of opportunities to run for office and be elected without family and personal connections, or money.

Finally, *social equality* proponents argue that the quality of life—and its attributes of good housing, health, education, employment, and leisure—should not be based on one's gender, race, sexual orientation, religion, age (only to the extent it correlates with health, for example), disability (only to the extent it makes impossible to perform specific jobs, for example), or citizenship status (with the exception of work authorization, for example). Social equality is perhaps the broadest of these conceptions, and overlaps to a large extent with the other three. It is also the most consistent with our framework, although we include specific indicators that reflect all four conceptions.

## 1.2 Prior Research on Equality

### 1.2.1 Economy

Much has been written about economic inequality, and often it is the first thing people think about when they think about inequality. Economic inequality is connected to many other types of inequality, and has been shown to have deleterious effects on, for example, health, justice, and education, as well as increasing the potential for political unrest and social conflict (Thorbecke and Charumilind 2002). Globally, economic inequality is considerable, with a large proportion of global wealth concentrated in the hands of the wealthy few. In 2014, the top 1 % possessed 48 % of the global wealth and the top 20 % much of the remainder, leaving only 5.5 % to be shared by the bottom 80 % of the population (Hardoon 2015); recently, the percentage of global wealth possessed by the top 1 % passed the 50 % mark (Shorrocks et al. 2015). While the United States is not the most unequal globally, income inequality has increased at a high rate over the last few decades and it ranks as one of the most unequal industrialized nations (e.g., Jones 2015; Smeeding 2005; Thorbecke and Charumilind 2002). Within the United States, New Yorkers experience particularly high levels of economic inequality: in 2012, the top 1 % of Americans possessed 22 % of the country's wealth, but in NYC they possessed 39 % (Winship 2014).

While specific individual population characteristics (e.g., race, gender) cannot explain all of the variance in economic inequality (Cowell and Jenkins 1995), the effects of some are well-documented. There are considerable race and gender gaps in income and employment (DeNavas-Walt and Proctor 2015; England et al. 2012; Ritter and Taylor 2011). Median household income for non-Hispanic whites is 1.70 times higher than for blacks (\$60,256 vs. \$35,398, respectively, in 2014), and 1.42 times higher than for Hispanics (\$42,491), while women earn 79¢ on average for every dollar earned by men (DeNavas-Walt and Proctor 2015). Education has been shown to decrease the gender gap in wages, but it persists in the United States and beyond even for highly educated women and even when differential rates of employment are accounted for (England et al. 2012; Mussida and Picchio 2014).

Within the United States, the likelihood of living in poverty varies by group. Rates of poverty are much higher for blacks and Hispanics than for whites, for immigrants than for those born in the United States, and for individuals with than without a disability; rates decrease with each increase in level of education (DeNavas-Walt and Proctor 2015). Additionally, roughly one in five children live in poverty, and the myriad effects of poverty on children's development have been well-documented (Brooks-Gunn and Duncan 1997; Evans 2004): poverty has been linked to adverse outcomes across a number of areas including health, cognitive and emotional development, and school achievement (Brooks-Gunn and Duncan 1997).

### 1.2.2 Education

Education is both a cause and an effect of income inequality, and there are disparities in educational outcomes for several different groups that begin in early education and persist through college and beyond (e.g., Jencks and Phillips 1998). While the relationship has gotten smaller over the years, there continues to be a significant association between socioeconomic status (SES) and academic achievement, one that increases with increasing years of school (Sirin 2005). The racial and ethnic disparities in education are large and

persistent, with black and Hispanic children showing lower levels of academic achievement than white and Asian children across multiple domains (Farkas 2003; Jencks and Phillips 1998; Norman et al. 2001), and lower degree attainment rates (Alon et al. 2010; Jencks and Phillips 1998). Native language and immigration status may also have an influence, particularly for Hispanic students: English language learners have been shown to have lower levels of academic achievement than native English speakers (Genesee et al. 2006). Additionally, while women now outperform men on verbal aptitude and a number of specific topics (Niederle and Vesterlund 2010), women are still underrepresented and have lesser performance in the science, technology, engineering, and mathematics (STEM) disciplines (Bacharach et al. 2003; Fryer and Levitt 2010; Niederle and Vesterlund 2010).

There is some evidence that educational disparities begin even prior to the start of formal education: cognitive differences between low and high SES children exist at entry to kindergarten (Lee and Burkam 2002; Ramey et al. 2000), and black and Hispanic children enter kindergarten and first grade with lower levels of school readiness than white and Asian children (Farkas 2003). Thus, some researchers have investigated whether early school education can reduce later disparities both within and outside of academic performance; the findings from their research suggest that preschool interventions can have positive short-term and long-term effects on both academic achievement and broader life outcomes (Campbell et al. 2002; Currie 2001; Garces et al. 2002; Ramey et al. 2000; Reynolds et al. 2011). Providing additional support to the families of young children—an integral part of Head Start and other related programs (see Currie 2001)—may have additional benefits, as home environment, rather than differences in the quality of education per se, appears to be responsible for at least some of the disparities in academic performance (Entwisle and Alexander 1992).

### 1.2.3 Health

Health is also tied to numerous other areas as both a contributor and an outcome, including education and SES more broadly. For example, while life expectancy has generally increased over time (but see Case and Deaton 2015)—and racial/ethnic disparities have lessened (Centers for Disease Control and Prevention 2016)—a closer examination of the data suggests that these increases have occurred largely among those with at least some higher education (Meara et al. 2008). In another example, Wilkinson and Pickett (2009) compared health and other social indicators across 23 countries and concluded that societies have better outcomes whenever income inequalities are smaller, at least in the context of wealthy nations.

While the health of America in general has improved, racial and ethnic minorities continue to have consistently worse health outcomes than whites, even when other factors are controlled for (Kington and Nickens 2001). Racial and ethnic disparities in health outcomes exist across the life cycle, from higher infant mortality rates (Collins and David 2009; Hauck et al. 2011) and poorer early childhood health and health care (Flores et al. 2005), to poorer health in old age (Cagney et al. 2005). Racial and ethnic minorities are also less likely than whites to receive treatment for mental health problems (Alegria et al. 2008). Such differences are particularly pronounced for blacks, and black-white disparities have received the most attention in the literature (Kington and Nickens 2001). They not only have worse health outcomes, but lower levels of preventive care and higher levels of environmental hazards as indicated by such factors as lower influenza vaccination rates (Schneider et al. 2001), higher asthma hospitalization and mortality rates (Gupta et al. 2006), and higher child blood lead levels (Jones et al. 2009) than other groups.

SES is also a primary determinant of health status as well as access to and use of health care (Braveman et al. 2010; Fiscella et al. 2000), and it explains some of the racial and ethnic disparities in health (Farmer and Ferraro 2005; Williams and Jackson 2005). Education and occupational prestige are linked to both general health and to life expectancy, although they appear to have a greater effect for whites than blacks (Braveman et al. 2010; Farmer and Ferraro 2005; Meara et al. 2008). The link between income and health is well known (Braveman et al. 2010; Kawachi 2000), and there is also a negative association between income inequality and health status (Kawachi 2000; Subramanian and Kawachi 2004; Wilkinson and Pickett 2009). Such findings appear to be particularly robust when comparing states within the United States (Kawachi and Subramanian 2014), although they also exist globally as described above (Wilkinson and Pickett 2009).

Some, though not all (see e.g., Waidmann and Rajan 2000; Zuvekas and Taliaferro 2003), of the racial and ethnic and SES-based differences in health outcomes may be related to insurance coverage rates and/or to having a usual source of health care. Reducing disparities in insurance coverage has been shown to reduce disparities in access to the health care system, including having a usual source of care (Waidmann and Rajan 2000). While those with lower incomes may have less access to insurance, racial and ethnic minorities are also disproportionately likely to be uninsured (Hargraves 2002; Waidmann and Rajan 2000) and to lack a regular health care provider (Hargraves 2002; Lillie-Blanton and Hoffman 2005; Waidmann and Rajan 2000; Zuvekas and Taliaferro 2003). A portion of the racial and ethnic disparities in health care may also be attributed to other factors that correlate with race and ethnicity: immigrants and non-citizens are more likely to be uninsured and to have reduced access to medical care (Waidmann and Rajan 2000).

#### 1.2.4 Housing

Housing and neighborhood quality are associated with mental and physical health (Gibson et al. 2011; Krieger and Higgins 2002; Wilkinson 1999), and housing tenure may be associated with psychosocial health (Gibson et al. 2011), as is the lack of housing (i.e., homelessness; Krieger and Higgins 2002; Wilkinson 1999). Poor-quality housing, which may include problems with mold, damp, heat and hot water, food storage, drinking water safety, vermin, and crowding, among other things, have been linked to a host of health problems including the spread of infectious disease, the development of chronic respiratory and other health disorders, physical injury, and mental health problems (Gibson et al. 2011; Krieger and Higgins 2002). Compounding the problem is that certain groups disproportionately suffer the effects of substandard housing: racial and ethnic minorities, immigrants, and people with low income are more likely to live in homes with structural deficits; incomplete plumbing facilities; irritants such as damp, mold, or vermin; insufficient heat or hot water; or that are overcrowded, among other problems (Krieger and Higgins 2002; Krivo 1995; Myers et al. 1996).

While income may be the primary determinant of the housing one is able to afford, there are several other factors associated with inequality in housing (although they may in some cases operate in conjunction with income). Racial and ethnic minorities are persistently less likely to be homeowners, even as overall homeownership rates have risen (DeSilva and Elmelech 2012; Elmelech 2004). Housing disparities may also be attributed to a number of other factors including educational attainment, immigration status (i.e., the proportion of the group comprised by immigrants), household composition (e.g., same-sex vs. opposite-sex couples), and residential segregation (DeSilva and Elmelech 2012; Leppel 2007).

There are similar disparities among renters, with people with low income, racial and ethnic minorities, and immigrants being disproportionately likely to be rent burdened, spending more than 30 % of their income on rent (Aratani et al. 2011; Oh 1995). The likelihood of being rent burdened is also higher for older individuals, particularly those 65 and older (Oh 1995). While income accounts for some differences, some are also driven by discrimination. Although it has declined over time, racial and ethnic minorities continue to experience housing discrimination in both the rental and sales markets, with non-Hispanic whites consistently favored over other groups in terms of the types of housing and financing available to them (Pager and Shepherd 2008; Turner and Ross 2003a, b; Turner et al. 2002). Housing discrimination may also be based on household composition, with same-sex couples and single parents more likely to experience discrimination (Lauster and Easterbrook 2011; Leppel 2007).

### 1.2.5 Justice

Discrimination in the justice system is frequently discussed in the media and in academic outlets, and disparities in victimization, offending, and treatment by the criminal justice system are well-known. Research over the past few decades shows that blacks, and to a somewhat lesser extent Hispanics, are disproportionately likely to be victims of violent crime, with much higher homicide, shooting, and robbery victimization rates than whites (Harrell 2007; Lauritsen and Heimer 2010; Rennison 2001; Sampson and Lauritsen 1997; Truman and Langton 2014). There is also a greater risk among children under 18 and males (Truman and Langton 2014). Women, racial and ethnic minorities, and those with low income are at increased risk of intimate partner violence (Rennison and Planty 2003; West 2004), although household income may account for some of the existing racial and ethnic disparities (Rennison and Planty 2003). There are also disparities in child abuse and neglect, with black children (Fluke et al. 2003; Sedlak et al. 2010) and children with disabilities (Jones et al. 2012; Sedlak et al. 2010) disproportionately likely to be victimized.

Blacks and Hispanics are also disproportionately represented as offenders, as are youths and males, and generally receive more negative outcomes at all stages of the criminal justice process (e.g., Kochel et al. 2011; Kutateladze et al. 2012, 2014; Pettit and Western 2004). They are more likely to be arrested than whites even when a host of other variables including offense severity are controlled for (Kochel et al. 2011). They are also overrepresented in jails and prisons (Pettit and Western 2004). Unsurprisingly then, racial and ethnic minorities are less likely than whites to be satisfied with local police (Smith et al. 1999), and more likely to view police as unfair (Gallagher et al. 2001).

Race and ethnicity also influence political and civic participation, as do a number of other factors. Racial and ethnic minorities report less participation in political activities, have lower rates of voter registration and turnout, and are underrepresented within government (Harder and Krosnick 2008; Hero and Tolbert 1995; Leighley and Vedlitz 1999; Tate 2003; Xu 2005). In contrast to the criminal justice system, however, Asians, rather than blacks or Hispanics tend to have the lowest participation rates (Harder and Krosnick 2008; Xu 2005). SES—particularly education and income—is also positively associated with both political and civic engagement (Brehm and Rahn 1997; Leighley and Vedlitz 1999), and some racial and ethnic differences in participation rates are eliminated once SES is accounted for (Harder and Krosnick 2008). The gender gap in participation has lessened over time (Harder and Krosnick 2008) and there is some evidence that women

have higher voter turnout rates (Sanbonmatsu 2006); however, they are still vastly underrepresented in government (Sanbonmatsu 2006).

### 1.2.6 Other

Inequalities in the United States and beyond are far-reaching, touching on a number of domains outside these five. For example, public transportation is critical for travel to jobs, school, medical care, and other necessities for those without cars or who are unable to drive (Garrett and Taylor 1999), yet not all public transportation is accessible to individuals with physical disabilities. Relatedly, longer commute times reduce the amount of time available for non-work activities, and are associated with lower levels of social capital (Besser et al. 2008), civic participation (Poulsen and Svendsen 2005; Schaff 1952), life satisfaction (Hilbrecht et al. 2014), and employment (Garrett and Taylor 1999; Kneebone and Holmes 2015), in addition to a host of health problems (Hansson et al. 2011; Hoehner et al. 2012). However, commuting times are longer for racial and ethnic minorities and those with lower incomes (Kneebone and Holmes 2015; Pratt Center for Community Development 2010).

Examples of inequalities abound in accessing both essential and recreational services. High-speed Internet is increasingly important for obtaining and maintaining employment, education, and access to information about civic or cultural activities, among other things; yet blacks and Hispanics, seniors, those with less education, and those with lower incomes are less likely to have access to high-speed Internet at home (Office of the New York City Comptroller 2014; Zickuhr and Smith 2012). Participation in recreational activities can affect health outcomes and quality of life for individuals with physical disabilities (Lundberg et al. 2011; Murphy et al. 2008), yet their access to these activities may be severely limited. The presence of arts and cultural organizations and participation in the arts can help to revitalize neighborhoods (Stern and Seifert 2010); foster community engagement (Stern and Seifert 1998); improve academic and social outcomes, particularly for at-risk children (Catterall et al. 2012); and improve mental and physical health among seniors (Castora-Binkley et al. 2010; Murray and Crummett 2010); yet both access and participation are influenced by education, income, age, race, and ethnicity (Dimaggio and Ostrower 1992; Moore 1998; Stern and Seifert 1998).

In designing our tool, we wished to examine inequalities in all of these areas; however, our goal was to develop a holistic picture of inequality that could account for the inter-connections between all of these areas and to see how inequalities differ, in addition to allowing us to examine them individually. As can be seen above, prior work tends to focus on outcomes within one particular area or on how inequalities within one area affect outcomes in another. Thus, while prior work has laid the groundwork for such an investigation, the field still lacks a multi-sectorial instrument of equality, a gap we sought to fill with the Equality Indicators.

## 1.3 Opportunities Versus Outcomes: How Far do Equal Rights Extend?

Before developing the framework, however, it was first necessary to define equality. One of the biggest controversies among scholars is concerned with the scope of equality, the question of “how far do equal rights extend?” (Piketty 2015: 480). Equal opportunity proponents often argue that as long as we can create truly equal opportunities at birth, whether ultimately some end up rich and others poor should not really matter. The opponents of this argument do not think equality of opportunities is enough if it does not translate into the same, or at least reasonably similar, outcomes. Arguably, neither of these



goals is realistic: while equality in outcomes is a more aspirational target, equality in opportunities is also often unattainable (e.g., to give all newborns the same opportunities would require that their parents had the same opportunities).

The proposed conceptualization is geared toward measuring equality in outcomes, which goes well beyond equality of opportunities and even the Sen-ian “equal capability for functioning” (Sen 1992; Nussbaum and Sen 1993), neither of which leads to equal outcomes given how differently people use their opportunities or capabilities. Inspired by the UN Universal Declaration of Human Rights’ non-discrimination clauses (Articles 1 and 2), we conceptualize equality as *everyone having the same economic, educational, health, housing, justice, and service outcomes regardless of race, ethnicity, disability, sex, gender identity, sexual orientation, age, immigration status, neighborhood of residence, criminal record, or other characteristics*. While this is an aspirational goal, the proposed framework aims to measure the proximity to this ultimate goal: the closer a city gets to it, the better its institutions committed to equality are performing and the better the outcomes for all members of the population.

## 2 Data and Method

### 2.1 Structure of Equality Indicators Framework

The Equality Indicators framework is organized at three different levels, each of increasing specificity. The first is the *theme* level, which includes six broad domains reflected in our operationalization of equality described above: (1) Economy, (2) Education, (3) Health, (4) Housing, (5) Justice, and (6) Services. Within each theme, there are four narrower *topics*. For example, Economy includes: (a) poverty, (b) employment, (c) income and benefits, and (d) business development. Each topic is further broken down into four *indicators*. Thus, the framework contains a total of 96 indicators organized under 16 topics forming six thematic areas. While there are many more important indicators within each topic and theme (and additional important topics and themes), to ensure the sustainability of the tool over time in NYC, and its replicability in less data-rich environments, it was necessary to restrict the number of items included in the framework. Data to populate the indicators and to inform progress on topics and themes will be collected annually.

### 2.2 Groups Adversely Affected by Inequalities

Equality indicators are different from broader social or economic indicators of overall literacy or unemployment rates, for example, because they focus on the comparison of the populations most and least vulnerable to specific inequalities. Indeed, the amount of inequality a person sees themselves as experiencing and their more general life satisfaction may be closely linked to comparisons of their own state to that of others and to what they feel they deserve (which is also partially based on comparison to others; see Michalos 1985; Runciman 1966; Wilkinson and Pickett 2009). The proposed framework looks into the experiences of groups who are closer to the bottom of the inequality continuum, as compared to the experiences of those closer to the top. For example, if there is a gender gap in literacy, a specific indicator would compare women’s and men’s literacy rates. While the groups most affected by inequality vary by place and time, for our initial investigation in NYC, the groups included were: children under 18; immigrants; individuals with a criminal

record; individuals living in poverty; individuals with physical or intellectual disabilities; individuals with less than a high school diploma; lesbian, gay, bisexual, transgender, and queer (LGBTQ) individuals; racial and ethnic minorities; religious minorities; seniors 65 and older; single parents; and women.

We used this vulnerability typology to build most indicators. For these indicators, we selected relevant groups based on existing literature and discussions with experts and community groups (discussed next). For example, we disaggregated small business development or executive positions in government by gender, homelessness by race, and employment by the presence of a criminal record. For some indicators, we combined these characteristics to highlight the greatest inequalities (see indicators 14, 83, and 93). While our desire to account for the experiences of multiple groups limits our ability to compare across indicators within a given year (because, for example, STEM degrees compare women and men, while arrest rates compare blacks and whites), it enables us account for the greatest inequalities within each domain.

### 2.3 Process of Developing the Framework

We relied on seven sources of information, assistance, or experience to develop the framework, and determine and operationalize indicators. First, our previous experience developing performance measures and collecting data in the United States and internationally, including in post-conflict and data-poor countries (e.g., Georgia, Haiti, Liberia), informed the creation of the initial framework. Second, we conducted a thorough review of existing indices in the United States and internationally (e.g., Boston Indicator Project, UN Rule of Law Indicators) to inform the structure and content of the tool and avoid unnecessary duplication. Third, we engaged in an exploratory analysis of NYC-wide data sources and reporting mechanisms (e.g., Mayor's Management Report) which helped us understand the availability, sources, and quality of existing administrative and secondary public survey data. Fourth, we recruited 16 international experts on equality and performance indicators who reviewed our initial framework and scoring methodology and provided written feedback.<sup>1</sup> Fifth, we held three NYC-wide community meetings with between 40 and 85 individuals from community-based organizations per meeting who provided both oral and written feedback.<sup>2</sup> Sixth, the NYC Mayor's Office of Operations, in charge of compiling data across city agencies and measuring performance, provided multiple rounds of oral and written comments on both the framework and individual indicators. Finally, we tested draft indicators to verify the availability of secondary data and the merit of individual indicators based on cursory analyses of these data.

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<sup>1</sup> Experts were generally supportive of the framework and the purposes underlying its creation, as well as the themes and groups identified as being affected by inequality. However, some experts expressed concern about the size of the initial framework (which included 180–240 indicators), and some initial concepts. As a result the tool was shortened and the framework restructured. Although there was no consensus about the scoring methodology, most experts viewed scoring as an important step for aggregating information at the topic and theme levels.

<sup>2</sup> At the first meeting, we introduced the framework and solicited feedback on the working definition of equality, themes, and groups affected by inequality. At the second meeting, attendees broke into six groups by theme. Within these groups they provided feedback on topics and suggested potential indicators to include within each topic. At the final of the three meetings, we presented the changes that had been made based on the feedback from the first two meetings and received one final round of feedback.

## 2.4 Data Sources

The Equality Indicators rely on both administrative and public survey data. We obtained administrative data covering the most recent 12-month period available from city and state government agencies (e.g., Administration for Children's Services, New York State Department of Taxation and Finance), not-for-profit organizations (e.g., Center for the Independence of the Disabled), and research and academic institutions (e.g., Furman Center for Real Estate and Urban Policy). Some of these data were publicly available, while others required special requests and follow-up. In some cases, we obtained raw datasets; however, several agencies provided only percentages based on the specific requests we made. Data used for the 2015 indicators discussed in this paper came from 2013 to 2015, which was unavoidable given the availability of data. This also means that every year we will have up to a 2-year lag. For more detail on data sources for specific indicators, see Online Appendix A.

We supplemented these data with survey data obtained directly from NYC residents. We collected public survey data both from a survey designed for the purpose of this tool (primary public survey data) and from annual public surveys currently conducted by government agencies and other organizations (secondary public survey data; e.g., Community Health Survey, Current Population Survey). The survey conducted for this study used a mixed method of recruitment and data collection relying on a combination of random digit dialing, automated phone calls, and in-person interceptions (see Online Appendix B for further detail and Appendix C for the survey questionnaire); the final sample included 3080 participants. Given our intention to collect data on an ongoing basis, we used only annually-collected secondary public surveys. Finally, all information covered the five boroughs of NYC only (i.e., not the metropolitan area).

## 2.5 Scoring Approach

Scoring was necessary for two purposes: to standardize various data available in different formats (e.g., percentages, rates); and to synthesize findings at the topic and theme levels (as discussing findings for all 96 indicators is not always practical, especially given that the audiences of this tool vary from government officials to academics to community members). We calculated scores based on either ratios (84 indicators), percentages (11 indicators), or rates (1 indicator), and each *indicator score* ranges from 1 (lowest possible) to 100 (highest possible). As scores approach 100, inequalities decrease; however, until scores reach at least 90, considerable inequalities are still present: even a score of 70 means that one group is 30 % more likely to experience a particular outcome. While both 5- and 10-point scoring methods were considered, we ultimately decided on a 100-point scale so that the indicators would be able to capture even minor changes in equality from 1 year to the next.<sup>3</sup>

For indicators expressed as ratios, which comprise the majority of those included, we compared two groups—generally the most and least likely to be disadvantaged for each issue—to calculate the ratios. For example, we compared: poverty levels among citizens and non-citizens (ind. 3); on-time high school graduation of people with and without a disability (ind. 27); and blacks' and whites' violent victimization rates (ind. 65). For these

<sup>3</sup> Among other methods of aggregation, using standard deviations was also considered. However, this would have required obtaining raw data for all 96 indicators which is neither possible in all cases nor practical in terms of the cost of gathering that information over time.

indicators, scores decrease based on steadily increasing increments in ratios (see Online Appendix D for more detail on converting ratios to scores). For the 11 indicators expressed as percentages (ind. 8, 13, 17, 19, 32, 75, 80, 82, 83, 90, and 91) and the one expressed as a rate (ind. 68), scores correspond with the actual percentage or rate, varying based only on whether 0 or 100 was the optimal number.

The score for each of the 24 topics is merely the average of the scores for each of the four indicators under that topic. Similarly, scores for each theme are the average of the four topic scores under that theme. Finally, the average of the scores for each of the six themes produces the citywide score for a given year. These higher-level scores also range from 1 to 100.

In addition to these static scores, in the future and on an annual basis, the tool will employ dynamic scores to track change from one round of data collection to another. These dynamic scores will capture an increase, decrease, or no change from the previous year, and will enable us to compare levels of change across indicators, topics, themes, and eventually cities. Positive numbers will denote progress while negative numbers will denote regress. Dynamic scores will be calculated by subtracting the prior year's score from the current year's score. The dynamic topic and theme scores will only be produced when all indicators within the topic and all topics within the theme, respectively, are scored. Note that given that we have only conducted one round of data collection, we here present baseline findings only; we will use these baseline findings to measure progress in the future and produce dynamic scores.

## 3 Results

### 3.1 Economic Equality

This theme includes topics that assess issues ranging from the ability to meet basic needs to business health, and the specific measures included explore economic outcomes for a number of different disadvantaged groups. The lowest score within this theme was found in *Business Development* (topic score = 39.8), followed by *Poverty* (42.5), *Employment* (46.3), and *Income and Benefits* (53.5).

Research revealed vast disparities in rates of *Poverty* (see Table 1), although inequality was most severely pronounced in the area of food security (score of 15). *Employment* also showed large differences. The biggest inequality was in the unemployment rates of people on probation compared to the general public: with a score of 3, this indicator received the second lowest score of all the indicators. Race is also a clear marker of inequality in unemployment rates, with a score of 32. Within *Income and Benefits*, the most dramatic inequality was found in the area of retirement savings for low- versus middle-income groups (14). Within *Business Development*, only a small percentage of the businesses receiving certification as a minority and women-owned business enterprise were able to secure city contracts, as indicated by a low score of 19.

### 3.2 Educational Equality

Education in the United States encompasses several discrete phases of learning: early education, elementary and middle school education, high school education, and higher education, and we measure inequality in each of these four phases. Topic scores decreased

**Table 1** Economy indicators, scores, and findings (theme score = 45.5)

| #                          | Name                              | Definition   | Score | Finding   |
|----------------------------|-----------------------------------|--|-------|---|
| Poverty (42.5)             |                                   |  |       |   |
| 1                          | Race and poverty                  | Ratio between the percentages of Asians and whites living below the poverty line   | 51    | Asian: 25.9 %;<br>white: 15.0 %<br>Asian-to-white<br>ratio = 1.727                          |
| 2                          | Race and food security            | Ratio between the percentages of Hispanics and Asians with low or very low food security                                   | 15    | Hispanic: 29.5 %;<br>Asian: 4.7 %<br>Hispanic-to-Asian<br>ratio = 6.288                     |
| 3                          | Citizenship status and poverty    | Ratio between the percentages of non-citizens and citizens living below the poverty line                                   | 58    | Non-citizen:<br>30.7 %; citizen:<br>19.5 %<br>Non-citizen-to-<br>citizen<br>ratio = 1.574   |
| 4                          | Family composition and poverty    | Ratio between the percentages of single-parent and two-parent households living below the poverty line                     | 46    | 1-parent: 32.1 %;<br>2-parent: 17.3 %<br>Single-to-two-<br>parent<br>ratio = 1.855          |
| Employment (46.3)          |                                   |  |       |   |
| 5                          | Race and unemployment             | Ratio between the unemployment rates for blacks and whites   | 32    | Black: 14.0 %;<br>white: 4.3 %<br>Black-to-white<br>ratio = 3.256                           |
| 6                          | Disability and unemployment       | Ratio between the unemployment rates for people with and without disabilities  | 74    | With disability:<br>9.6 %; without:<br>7.8 %<br>With-to-w/o-<br>disability<br>ratio = 1.231 |
| 7                          | Probation status and unemployment | Ratio between the unemployment rates for probation clients and the general population                                      | 3     | On probation:<br>60.8 %; general:<br>6.5 %<br>Black-to-white<br>ratio = 9.354               |
| 8                          | Employment assistance             | Percentage of cash assistance recipients who were no longer employed 180 days after being placed in a job                  | 76    | 24.5 % no longer<br>employed after<br>180 days  |
| Income and benefits (53.5) |                                   |  |       |   |
| 9                          | Race and income                   | Ratio between the median yearly personal incomes for Hispanics and whites  | 54    | Hispanic: \$34,000;<br>white: \$56,200<br>White-to-Hispanic<br>ratio = 1.653                |
| 10                         | Income and retirement savings     | Ratio between the percentages of people in the bottom and middle income groups who do not have retirement or pension plans | 14    | Bottom: 78.8 %;<br>middle: 12.1 %<br>Bottom-to-middle<br>ratio = 6.512                      |

**Table 1** continued

| #                           | Name                                      | Definition  | Score | Finding  |
|-----------------------------|---|---|-------|--|
| 11                          | Immigration status and income             | Ratio between the median yearly personal incomes for foreign-born and US-born individuals   | 64    | Immigrant: \$35,000; non: \$49,879<br>Immigrant-to-non-im. ratio = 1.425         |
| 12                          | Gender and income                         | Ratio between the median yearly personal incomes for women and men  | 82    | Women: \$38,423; men: \$42,000<br>Men-to-women ratio = 1.093                     |
| Business development (39.8) |   |   |       |  |
| 13                          | Race/gender and City contracts            | Percentage of minority and women-owned business enterprise certificate recipients that were not awarded City government contracts | 19    | Certified: 3783; awarded: 684<br>81.9 % of certified MWBEs not awarded contracts |
| 14                          | Race and business ownership               | Ratio between the percentages of Hispanic and white households that include a business owner                                      | 30    | Hispanic: 3.8 %; white: 13.3 %<br>White-to-black ratio = 3.500                   |
| 15                          | Immigration status and business ownership | Ratio between the percentages of foreign-born and US-born households that include a business owner                                | 57    | Foreign-born: 5.7 %; US-born: 9.0 %<br>Foreign-to-US-born ratio = 1.579          |
| 16                          | Location and business revenue             | Ratio between the percentages of sales tax collected in Manhattan and other boroughs  | 53    | Manhattan: 62.9 %; others: 37.1 %<br>Manhattan-to-others ratio = 1.698           |

with each phase of learning (see Table 2). *Early Education* had the highest score (56.8), followed closely by *Elementary and Middle School Education* (55.0). The score for *High School Education* was 10 points lower (44.8), and the score for *Higher Education* was even lower (41.3).

Although marked inequalities were found across indicators within *Early Education*, the lowest score was found for the indicator measuring perceived physical proximity to child care; its score of 39 shows considerable inequality between families in different income categories. For *Elementary and Middle School Education*, the lowest score was for race and math proficiency (37), demonstrating large disparities between blacks and Asians in math scores. *High School Education* indicators had even lower scores. The indicator with the lowest score within this area (22) showed that there are large racial and ethnic disparities in receiving an Advanced Regents diploma. Finally, *Higher Education's* lower score is driven mainly by one very low indicator score—a score of 9 on the measure of participation in vocational training among sentenced people in jail. However, there were also quite large gender disparities in STEM degree attainment (37).

**Table 2** Education indicators, scores, and findings (theme score = 49.4)

| #   | Name   | Definition  | Score | Finding   |
|---|--|---|-------|---|
| Early education (56.8)                        |  |   |       |   |
| 17  | Race and pre-K diversity                       | Percentage of pre-Ks with more than 75 % of enrollees from one racial or ethnic group   | 64    | 36.5 % of pre-Ks over 75 % one racial/ethnic group                              |
| 18  | Income and child care facilities               | Ratio between the percentages of parents in the bottom and top income groups without a child care center within a 10-min walk                             | 39    | Bottom: 14.3 %; top: 6.5 %<br>Bottom-to-top ratio = 2.200                       |
| 19  | Foster care status and pre-K enrollment        | Percentage of 4-year-olds in foster care who are not enrolled in pre-K  | 51    | 49.1 % of children not enrolled in pre-K  |
| 20  | Family composition and early school enrollment | Ratio between the percentages of 3- and 4-year-olds living with one and two parents who are not enrolled in school  | 73    | 1-parent: 45.9 %;<br>2-parent: 36.6 %<br>Single-to-two-parent ratio = 1.254     |
| Elementary and middle school education (55.0) |  |   |       |   |
| 21  | Race and math proficiency                      | Ratio between the percentages of blacks and Asians in grades 3–8 rated less than proficient on the math Common Core                                       | 37    | Black: 80.9 %; Asian: 32.6 %<br>Black-to-Asian ratio = 2.482                    |
| 22  | Income and school quality                      | Ratio between the percentages of schools rated less than proficient in the bottom and top income areas  | 46    | Bottom: 35.7 %; top: 19.2 %<br>Bottom-to-top ratio = 1.854                      |
| 23  | Income and bullying                            | Ratio between the percentages of students in schools located in the bottom and top income areas who believe students who are different are bullied        | 75    | Bottom: 13.3 %; top: 10.9 %<br>Bottom-to-top ratio = 1.218                      |
| 24  | Disability and English proficiency             | Ratio between the percentages of students with and without disabilities in grades 3–8 rated less than proficient on the English Language Arts Common Core | 62    | With disability: 93.1 %;<br>w/o: 63.2 %<br>With-to-w/o-disability ratio = 1.473 |
| High school education (44.8)                  |  |   |       |   |
| 25  | Race and academic performance                  | Ratio between the percentages of black and Asian high school graduates who received an Advanced Regents diploma   | 22    | Black: 11.8 %; Asian: 57.0 %<br>Asian-to-black ratio = 4.831                    |
| 26  | Race and foster care child education           | Ratio between the percentages of black and Asian foster care children 17 or older enrolled in high school who are not on track to graduate                | 77    | Black: 76.7 %; Asian: 65.7 %<br>Asian-to-black ratio = 1.167                    |
| 27  | Disability and on-time graduation              | Ratio between the percentages of students with and without disabilities not graduating from high school in 4 years  | 40    | With disability: 63.4 %;<br>w/o: 30.6 %<br>With-to-w/o-disability ratio = 2.072 |
| 28  | Immigration status and on-time graduation      | Ratio between the percentages of English Language Learner and English Proficient students not graduating in 4 years                                       | 40    | Learners: 67.5 %;<br>Proficient: 31.9 %<br>Learners-to-proficient ratio = 2.115 |

**Table 2** continued

| #                       | Name                                  | Definition  | Score | Finding  |
|-------------------------|---------------------------------------|---|-------|--|
| Higher education (41.3) |                                       |   |       |  |
| 29                      | Race and degree attainment            | Ratio between the percentages of Hispanics and whites who do not have a bachelor's degree                 | 49    | Hispanic: 63.3 %; white: 35.3 %<br>White-to-Hispanic ratio = 1.791 |
| 30                      | Race and post-degree employment       | Ratio between the percentages of blacks and whites who are not employed within 3 years of CUNY graduation | 70    | Black: 39.6 %; white: 30.3 %<br>White-to-black ratio = 1.307       |
| 31                      | Gender and science degrees            | Ratio between the percentages of female and male CUNY degree recipients whose degrees are in STEM fields  | 37    | Women: 7.4 %; men: 18.9 %<br>Men-to-women ratio = 2.569            |
| 32                      | Incarceration and vocational training | Percentage of the average daily sentenced jail population not attending vocational training               | 9     | 91.4 % of sentenced jail inmates do not attend vocational training |

### 3.3 Health Equality

The topic score of 14.3 for *Quality of Health Care* was the lowest by far—across Health topics and across all 24 topics in the tool. While not as dire, the other Health topics were also low scoring: *Mortality* with a score of 35.5 and *Wellbeing* with a score of 43.5. Although *Access to Health Care* scored somewhat higher (47.0), inequalities in this area are still vast (see Table 3).

The lowest score within *Access to Health Care* (29) was for the indicator comparing the proportion of foreign-born men and US-born women who lack a personal physician. All four indicators under *Quality of Health Care* were low scoring, two of them dramatically so. The indicator measuring differences in chlamydia rates between blacks and whites received a score of 1, the lowest possible score in our system. Similarly, with a score of 4, there were dramatic inequalities in tuberculosis rates based on immigration status. *Mortality* indicator scores were also low. Three of these indicators compared blacks to whites and showed marked inequality, with scores ranging from 15 for the indicator measuring HIV-death rates to 40 for infant mortality. The indicator scores under *Wellbeing* are more uniform than any other set of scores under the Health theme, ranging somewhat narrowly from a low of 37 (income and exercise) to a high of 55 (income and smoking).

### 3.4 Housing Equality

The scarcity of quality, affordable housing, especially for New Yorkers with incomes in the low to middle range, is a topic of frequent discussion, coverage in the media, and attention by public officials. Under the Housing theme, the lowest score was in *Homelessness* (35.8), followed very closely by *Quality of Housing* (36.0), while *Neighborhood* scored higher (45.0). *Affordability of Housing* had the highest score (56.8), but still showed considerable room for improvement. This may suggest that housing affordability is something that most New Yorkers struggle with, rather than a marker of inequality among different groups.



**Table 3** Health indicators, scores, and findings (theme score = 35.1)

| #                             | Name  | Definition  | Score | Finding   |
|-------------------------------|---|---|-------|---|
| Access to health care (47.0)  |   |   |       |   |
| 33                            | Race and dental care                          | Ratio between the percentages of Asians and whites who have not had a dental cleaning in the past year                | 56    | Asian: 53.2 %; white: 33.0 %<br>White-to-Asian ratio = 1.612                    |
| 34                            | Race and medical care                         | Ratio between the percentages of Hispanics and whites who did not receive medical care they needed in the past year   | 48    | Hispanic: 15.2 %; white: 8.4 %<br>Hispanic-to-white ratio = 1.810               |
| 35                            | Income and senior flu vaccination             | Ratio between the influenza non-vaccination rates for people 65 and older in the bottom and top income groups         | 55    | Bottom: 34.6 %; top: 21.1 %<br>Bottom-to-top ratio = 1.640                      |
| 36                            | Immigration status/gender and personal doctor | Ratio between the percentages of foreign-born men and US-born women without a personal doctor or health care provider | 29    | Foreign-born men: 33.3 %; US-born women: 9.1 %<br>FBM-to-USBW ratio = 3.659     |
| Quality of health care (14.3) |   |   |       |   |
| 37                            | Race and asthma hospitalization               | Ratio between blacks' and whites' hospitalization rates due to asthma   | 20    | Black: 476.3; white: 91.7<br>Black-to-white ratio = 5.192                       |
| 38                            | Race and diabetes hospitalization             | Ratio between blacks' and whites' hospitalization rates due to diabetes   | 32    | Black: 420.6; white: 130.8<br>Black-to-white ratio = 3.216                      |
| 39                            | Race and sexually transmitted diseases        | Ratio between blacks' and whites' chlamydia rates   | 1     | Black: 692.8; white: 69.5<br>Black-to-white ratio = 9.968                       |
| 40                            | Immigration status and tuberculosis           | Ratio between the tuberculosis rates for foreign-born and US-born individuals   | 4     | Immigrant: 15.5; non-immigrant: 1.7<br>Immigrant-to-non-immigrant ratio = 9.118 |
| Mortality (35.5)              |   |   |       |   |
| 41                            | Race and cardiovascular deaths                | Ratio between blacks' and Asians' heart disease mortality rates   | 40    | Black: 216.7; Asian: 100.9<br>Black-to-Asian ratio = 2.148                      |
| 42                            | Race and infant mortality                     | Ratio between the infant mortality rates for black and white mothers  | 35    | Black: 8.3; white: 3.0<br>Black-to-white ratio = 2.767                          |
| 43                            | Race and HIV-related deaths                   | Ratio between blacks' and whites' HIV-related death rates   | 15    | Black: 14.8; white: 2.3<br>Black-to-white ratio = 6.435                         |
| 44                            | Income and heroin deaths                      | Ratio between the rate of heroin overdose deaths in the highest and lowest poverty areas                              | 52    | Low: 5.7; very high: 9.7<br>Very-high-to-low ratio = 1.701                      |

**Table 3** continued

| #                | Name                              | Definition  | Score | Finding  |
|------------------|-----------------------------------|---|-------|--|
| Wellbeing (43.5) |                                   |   |       |  |
| 45               | Race and low birthweight          | Ratio between the percentages of black and white children born with low birthweight             | 44    | Black: 12.6 %; white: 6.6 %<br>Black-to-white ratio = 1.909  |
| 46               | Race and sugary drink consumption | Ratio between the percentages of blacks and whites who consume one or more sugary drinks a day  | 38    | Black: 33.7 %; white: 14.2 %<br>Black-to-white ratio = 2.373 |
| 47               | Income and smoking                | Ratio between the percentages of people in the bottom and top income groups who smoke           | 55    | Bottom: 11.2 %; top: 18.2 %<br>Top-to-bottom ratio = 1.625   |
| 48               | Income and exercise               | Ratio between the percentages of people in the bottom and top income groups who do not exercise | 37    | Bottom: 13.0 %; top: 32.2 %<br>Top-to-bottom ratio = 2.477   |

The scores for the four indicators of *Homelessness* varied widely, from a low of 11 to a high of 53 (see Table 4). With a score of 11, there were dramatic inequalities between single blacks and single whites in terms of their shelter use, indicating quite different prevalence rates. *Affordability of Housing* indicators scored somewhat higher, although our measures of homeownership showed that racial and ethnic minorities and lesbian/gay/bisexual (LGB) individuals (transgender are not included because our public survey asked only about sexual orientation) face considerable inequalities. Two of the four *Quality of Housing* indicator scores were very low, showing that overcrowding rates vary widely by race and ethnicity (score 22), and that residents of public and private housing show marked inequalities when it comes to safety as measured by murder rates (30). Our other indicators show that housing quality varies considerably by income. Within *Neighborhood*, we found large inequalities in perceived trust in neighbors (33) and the family friendliness of one's neighborhood (39) based on income.

### 3.5 Justice Equality

The indicators under this theme explore a broad definition of justice, rather than narrowly focusing on criminal justice; justice indicators scored fairly low, evidence of substantial inequality in this domain. Only one of the topics—*Political Power*—scored above 50 (50.5), followed by *Civic Engagement* (44.5), *Safety and Victimization* (32.0), and *Fairness of the Justice System* (25.3).

The first three *Safety and Victimization* indicators were all low scoring (see Table 5), although the lowest was the score of 12 for the indicator comparing rates of domestic violence homicide among blacks and whites. As suggested by its low topic score, all four indicators within *Fairness of the Justice System* were low scoring. Both of the indicators related to the exercise of discretion by justice system officials scored very low, showing large racial disparities in misdemeanor arrest rates (24), and even larger ones in jail admission rates (6). Overall, *Political Power* was the highest-scoring topic under the

**Table 4** Housing indicators, scores, and findings (theme score = 43.4)

| #                               | Name  | Definition  | Score | Finding   |
|---------------------------------|---|---|-------|---|
| Homelessness (35.8)             |   |   |       |   |
| 49                              | Race and homelessness                           | Ratio between blacks' and whites' single adult shelter use rate   | 11    | Black: 1045.6; white: 140.8<br>Black-to-white ratio = 7.425                             |
| 50                              | Child homelessness status and school attendance | Ratio between the daily absenteeism rates for homeless and non-homeless children  | 53    | Homeless: 14.6 %; non-homeless: 8.7 %<br>Homeless-to-non-homeless ratio: 1.678          |
| 51                              | Age and homelessness prevention                 | Ratio between the percentages of families with children and adult families who entered the shelter system after receiving preventative services | 39    | With children: 6.0 %; adults: 2.7 %<br>With-children-to-adults ratio: 2.222             |
| 52                              | Age and critical shelter incidents              | Ratio between the critical incident rates in the families with children and single adults shelter systems                                       | 40    | With children: 1.4; adults: 0.7<br>With-children-to-adults ratio: 2.000                 |
| Affordability of housing (56.8) |   |   |       |   |
| 53                              | Race and severe rent burden                     | Ratio between the percentages of Asian and white renters who spend more than 50 % of their income on rent                                       | 67    | Asian: 32.1 %; white: 23.6 %<br>Asian-to-white = 1.360                                  |
| 54                              | Race and homeownership                          | Ratio between the percentages of Hispanics and whites who are homeowners  | 38    | Hispanic: 41.4 %; white: 17.5 %<br>Hispanic-to-white ratio = 2.366                      |
| 55                              | Race and home purchase loan denial              | Ratio between the home purchase loan denial rates for black and white applicants  | 59    | Black: 21.4; white: 14.0<br>Black-to-white ratio = 1.529                                |
| 56                              | Sexual orientation and homeownership            | Ratio between the percentages of lesbian/gay/bisexual and heterosexual individuals who are homeowners   | 63    | Lesbian/gay/bisexual: 26.8 %; Heterosexual: 38.7 %<br>LGB-to-heterosexual ratio = 1.444 |
| Quality of housing (36.0)       |   |   |       |   |
| 57                              | Race and overcrowding                           | Ratio between the percentages of Hispanic and white renter households that have more than 1.5 people per room                                   | 22    | Hispanic: 6.6 %; white: 1.4 %<br>Hispanic-to-white ratio = 4.714                        |
| 58                              | Income and heat/hot water                       | Ratio between the percentages of people in the bottom and top income groups who have had problems with heat or hot water in the past year       | 44    | Bottom: 24.0 %; top: 12.5 %<br>Top-to-bottom ratio = 1.920                              |
| 59                              | Income and vermin infestation                   | Ratio between the percentages of people in the bottom and top income groups who have had problems with vermin in the past year                  | 48    | Bottom: 43.8 %; top: 24.1 %<br>Top-to-bottom ratio = 1.817                              |

**Table 4** continued

| #                   | Name  | Definition   | Score | Finding   |
|---------------------|---|--|-------|---|
| 60                  | Public housing and murder                   | Ratio between the murder rates in NYCHA housing developments and in the rest of NYC  | 30    | NYCHA:12.5; NYC: 3.5<br>NYCHA-to-NYC ratio = 3.531  |
| Neighborhood (45.0) |   |  |       |   |
| 61                  | Race and liquor store density in poor areas | Ratio between the numbers of liquor stores per 100,000 people in majority Hispanic and majority Asian neighborhoods within the bottom income areas | 52    | Hispanic: 16.0;<br>Asian: 9.4<br>Hispanic-to-Asian ratio = 1.713                                    |
| 62                  | Income and trust in neighbors               | Ratio between the percentages of people in the bottom and top income groups who think their neighbors are not willing to help one another          | 33    | Bottom: 32.5 %; top: 10.4 %<br>Bottom-to-top ratio = 3.125  |
| 63                  | Income and neighborhood family friendliness | Ratio between the percentages of people in the bottom and top income groups who think their neighborhood is not a good place to raise a family     | 39    | Bottom: 32.1 %; top: 14.5 %<br>Top-to-bottom ratio = 2.214  |
| 64                  | Sexual orientation and housing stability    | Ratio between the median years spent at their current address for lesbian/gay/bisexual and heterosexual individuals                                | 56    | Lesbian/gay/<br>bisexual: 5 years;<br>Heterosexual:<br>8 years<br>LGB-to-heterosexual ratio = 1.600 |

Justice theme. The indicators under this topic, however, show two different trends. The two indicators tapping people's perceptions had higher scores, while the indicators that directly measure conditions scored much lower, showing both gender and disability inequality. Within *Civic Engagement*, scores for the individual indicators ranged widely, but the lowest was for the indicator comparing blacks' versus Asians' public meeting attendance rates (23).

### 3.6 Equality in Services

This is by far the broadest of the six themes, encompassing services that meet New Yorkers' basic needs as well as those that enhance their quality of life, and mental and physical health. One of the four topics—*Transportation*—scored particularly low (27.0), evidence of pronounced inequality in this area, especially for people with disabilities. The score for *Arts and Culture* (42.0) was a distant second. Scores were somewhat higher in the area of *Essential Needs and Services* (46.8) but still concerning given the importance of these services for city residents. *Parks and Recreation* (74.8) is the only topic that scored substantially higher, yet still with considerable room for increasing equality.

Access to transportation is crucial to economic wellbeing, quality of life, and in some cases the ability to live independently, yet most of the individual indicators under *Transportation* scored very low, and it was the lowest scoring topic within the theme (see Table 6). The lowest-scoring indicators showed that individuals with physical disabilities face major, perhaps insurmountable, barriers to using the subway (score 18) or taking a taxi (8). Within *Essential Needs and Services* the lowest score was for the indicator measuring racial and ethnic disparities in access to hot and cold running water (38) although most

**Table 5** Justice indicators, scores, and findings (theme score = 38.1)

| #                                 | Name                                       | Definition  | Score | Finding  |
|-----------------------------------|--|---|-------|--|
| Safety and victimization (32.0)   |  |   |       |  |
| 65                                | Race and violent victimization             | Ratio between blacks' and whites' violent crime victimization rates   | 26    | Black: 757.4; white: 179.9<br>Black-to-white ratio = 4.209                             |
| 66                                | Race and domestic violence homicide        | Ratio between blacks' and whites' family-related homicide rates   | 12    | Black: 1.8; white: 0.3<br>Black-to-white ratio = 7.055                                 |
| 67                                | Foster care status and child abuse/neglect | Ratio between the rates of substantiated abuse and neglect cases for children in and out of foster care                             | 27    | In foster care: 4761.9; not: 1205.7<br>Foster-care-to-not ratio = 3.950                |
| 68                                | Hate crime victimization                   | Rate of hate crime victimization citywide   | 63    | 315 hate crimes; rate: 37.5  |
| Fairness of justice system (25.3) |  |   |       |  |
| 69                                | Race and misdemeanor arrest                | Ratio between blacks' and whites' misdemeanor arrest rates  | 24    | Black: 1773.4; white: 392.8<br>Black-to-white ratio = 4.515                            |
| 70                                | Race and trust in police                   | Ratio between the percentages of blacks and whites who would not be comfortable asking the police for help                          | 32    | Black: 26.4 %; white: 8.1 %<br>Black-to-white ratio = 3.259                            |
| 71                                | Race and jail admissions                   | Ratio between blacks' and whites' jail admissions' rates  | 6     | Black: 2077.1; white: 241.4<br>Black-to-white ratio = 8.605                            |
| 72                                | Religion and trust in police               | Ratio between the percentages of Muslim and Jewish residents who would not be comfortable asking the police for help                | 39    | Muslim: 19.0 %; Jewish: 8.8 %<br>Muslim-to-Jewish ratio = 2.159                        |
| Political power (50.5)            |  |   |       |  |
| 73                                | Race and representation in government      | Ratio between the percentages of blacks and whites who think the government is not racially and ethnically diverse                  | 72    | Black: 36.1 %; white: 28.4 %<br>Black-to-white ratio = 1.271                           |
| 74                                | Disability and voting access               | Percentage of polling sites in the most recent election with barriers to accessibility  | 31    | 69.2 % of election sites with barriers to accessibility                                |
| 75                                | Gender and representation in government    | Ratio between the percentages of female and male elected government officials   | 38    | Female: 29.5 %; male: 70.5 %<br>Female-to-male ratio = 2.390                           |
| 76                                | Education and political empowerment        | Ratio between the perceived inability to influence government decision making for people with lowest and highest educational levels | 61    | Lowest education: 70.6 %; highest education: 47.2 %<br>Lowest-to-highest ratio = 1.496 |
| Civil engagement (44.5)           |  |   |       |  |
| 77                                | Race and public meeting attendance         | Ratio between the percentages of Asians and blacks attending public meetings  | 23    | Asian: 1.6 %; black: 7.3 %<br>Black-to-Asian ratio = 4.563                             |
| 78                                | Income and voter turnout                   | Ratio between the voter turnout rates in the bottom and top income areas  | 67    | Bottom: 17.7 %; top: 24.2 %<br>Top-to-bottom ratio = 1.367                             |
| 79                                | Immigration status and volunteering        | Ratio between the percentages of foreign-born and US-born individuals who volunteer   | 40    | Foreign-born: 7.6 %; US: 15.2 %<br>US-to-foreign-born ratio = 2.000                    |

**Table 5** continued

| #  | Name                                 | Definition  | Score | Finding  |
|----|--------------------------------------|---|-------|--|
| 80 | Location and participatory budgeting | Percentage of city council districts not engaged in participatory budgeting | 48    | 52.9 % city council districts without participatory budgeting (27 out of 51 total) |

**Table 6** Services indicators, scores, and findings (theme score = 47.6)

| #                                   | Name   | Definition   | Score | Finding   |
|-------------------------------------|--|--|-------|---|
| Transportation (27.0)               |  |  |       |   |
| 81                                  | Race and commuting time                        | Ratio between the percentages of blacks and whites whose commute to work is an hour or more                                  | 59    | Black: 21.1 %; white: 13.8 %<br>Black-to-white ratio = 1.529            |
| 82                                  | Disability and subway accessibility            | Percentage of subway stations that are not wheelchair accessible   | 18    | 82.3 % of subway stations not wheelchair accessible                     |
| 83                                  | Disability and taxi accessibility              | Percentage of taxis that are not wheelchair accessible   | 8     | 92.2 % of taxis not wheelchair accessible                               |
| 84                                  | Location and bicycle lanes                     | Ratio between the percentages of non-Manhattan and Manhattan census tracts without bicycle lanes                             | 23    | Non-Mhtn: 51.4 %; Mhtn: 11.1 % Non-Mhtn-to-Mhtn ratio = 4.630           |
| Essential needs and services (46.8) |  |  |       |   |
| 85                                  | Race and hot/cold running water                | Ratio between the numbers of Hispanics and Asians per 100,000 who do not have hot and cold running water at home             | 38    | Hispanic: 361.1; Asian: 155.6<br>Hispanic-to-Asian ratio = 2.321        |
| 86                                  | Race and Internet access                       | Ratio between the percentages of blacks and Asians who do not have high-speed Internet at home                               | 45    | Black: 21.2 %; Asian: 11.3 %<br>Black-to-Asian ratio = 1.876            |
| 87                                  | Immigration status and stove/range             | Ratio between the numbers of foreign-born and US-born individuals per 100,000 who do not have a stove or range at home       | 54    | Foreign-born: 623.6; US-born: 377.5<br>Foreign-to-US-born ratio = 1.652 |
| 88                                  | Location and hospital quality                  | Ratio between the percentages of non-Manhattan and Manhattan hospitals given high ratings for timely and effective care      | 50    | Non-Mhtn: 39.4 %; Mhtn: 69.2 % Non-Mhtn-to-Mhtn ratio = 1.756           |
| Parks and recreation (74.8)         |  |  |       |   |
| 89                                  | Income and access to parks                     | Ratio between the percentages of residents in the bottom and top income areas who do not live within 5-minute walk of a park | 76    | Bottom: 19.4 %; top: 16.2 %<br>Bottom-to-top ratio = 1.198              |
| 90                                  | Disability and playground accessibility        | Percentage of playgrounds not accessible to children with physical disabilities  | 65    | 35.8 % of playgrounds not accessible                                    |
| 91                                  | Disability and recreation center accessibility | Percentage of City recreation centers not accessible to individuals with physical disabilities                               | 82    | 18.4 % of city recreation centers not accessible                        |

**Table 6** continued

| #                       | Name   | Definition  | Score | Finding  |
|-------------------------|--|---|-------|--|
| 92                      | Location and access to senior centers                | Ratio between the number of senior centers per 100,000 people aged 75 and older outside and within Manhattan                                | 76    | Non-Mhtn: 51.3; Mhtn: 61.5 Mhtn-to-non-Mhtn ratio = 1.198                              |
| Arts and culture (42.0) |  |   |       |  |
| 93                      | Income and funding for the arts                      | Ratio between the percentages of arts and cultural organizations in the bottom and top income areas that received City funding for the arts | 10    | Bottom: 7.3 %; top: 55.2 %<br>Bottom-to-top ratio = 7.562                              |
| 94                      | Location and senior access to the arts               | Ratio between the rate of SPARC placements per 100,000 people aged 75 and older outside and within Manhattan                                | 64    | Non-Mhtn: 9.8 %; Mhtn: 13.9 %<br>Mhtn-to-non-Mhtn ratio = 1.421                        |
| 95                      | Location and public library availability             | Ratio between the percentages of branches open 6 days a week outside and within Manhattan   | 40    | Non-NYPL: 49.0 %; NYPL: 100.0 %<br>NYPL-to-non-NYPL ratio = 2.041                      |
| 96                      | Parental education and children's arts participation | Ratio between the percentages of children whose parents have the least and most education who do not participate in arts activities         | 54    | Lowest education: 41.9 %; highest education: 25.3 %<br>Lowest-to-highest ratio = 1.656 |

indicators within the topic scored somewhat similarly. *Parks and Recreation* was the highest scoring topic, and contained one of the highest scoring indicators in the framework (disability and recreation center accessibility, score 82). Within *Arts and Culture*, the indicator measuring city funding received by arts organizations in wealthy versus poor areas of the city scored the lowest (10).

### 3.7 Overall Equality

As discussed earlier, the average of the scores for each of the six themes produces the citywide score for a given year. The 2015 NYC Equality Score was 43.2 out of a possible 100. This baseline score suggests that NYC is characterized by vast inequalities. Generally speaking this score means that overall, the disadvantaged groups represented here are twice as likely as those not disadvantaged to experience negative outcomes in fundamental areas of life.

As discussed above, our scoring methodology allows us not only to investigate individual themes, but to gain some idea of how inequalities manifest in different areas, and where they are particularly pronounced. Among the six themes, the scores were lowest for aspects of life related to Health (35.1) and Justice (38.1). Scores were somewhat higher for Housing (43.4), Economy (45.5), and Services (47.6), and the highest, though minimally, in Education (49.4). At the next level of analysis, the 24 topic scores range more widely, from a high of 74.8 for *Parks and Recreation* to a low of 14.3 for *Quality of Health Care*. Although the majority of scores fell below 50, only eight fell below 40, including three that scored below 30.

## 4 Conclusion

The appetite for tackling inequalities has grown in recent years, with American mayors increasingly pledging to fight inequality across all aspects of life, ranging from income to access to quality housing, transportation, education, and health care, and fair treatment for racial and ethnic minorities by the criminal justice system (e.g., The Cities of Opportunity Task Force, [usmayors.org/citiesofopportunity/](http://usmayors.org/citiesofopportunity/)). Fighting inequality is no easy task, however, and it is not always clear what cities can do to lessen inequality in these and other aspects of life, or at least prevent it from growing. The starting point is to explore where and how inequalities arise, in which areas of social and political life they are especially pronounced and harmful, and which groups are experiencing them most negatively.

The present study offers a new way to think about inequality at a local level, in the United States or internationally, with an understanding that in other cities—particularly in data-poor settings—indicators and many topics will need to be revised (although themes would likely remain largely unchanged). Despite a number of limitations inherent in the indicators' methodology and described later, this approach uniquely informs the study of inequality in several ways. First, the framework focuses on multiple fundamental areas of life—economic wellbeing, education, health, housing, justice, and access to services that are either essential or that substantially improve quality of life—all of which, although intertwined, have typically been studied in silos as described above. Second, we use an innovative approach of comparing life outcomes for those who tend to have very different degrees of advantage, power, and voice. Many of the indicators compare members of different racial and ethnic groups; several compare immigrants to non-immigrants, children in foster care to children outside the foster care system, people with and without disabilities, and those with high and low levels of income or education, to name a few. Third, the framework employs a 100-point scale to rate each indicator for a given time period, and then relies on these ratings to track change over time—the primary goal of this framework. Additionally, the scoring methodology increases the usability of the information by aggregating information at the topic, theme, and citywide level, rather than requiring users to look through 96 indicators each employing a different metric.

This aggregation and the more holistic look at inequalities across multiple sectors made it clear that while extensive inequality is present citywide, some areas had particularly low scores. Among the six themes encompassed by the Equality Indicators, inequality is particularly pronounced in Health, closely followed by Justice. We noted somewhat higher scores in Housing, followed by Economy, Services, and Education. It is worth noting, however, that no theme scored above 50, showing that inequalities were vast across all domains included. At the topic level, scores ranged widely, with *Parks and Recreation* receiving the highest score and *Quality of Health Care* the lowest. These scores will gain greater objectivity when compared over time; however, they are still important “red flags” of inequality for any given year, despite the presence of the unavoidable subjectivity of selecting indicators.

In fact, the inherent subjectivity in decisions regarding what to include as an indicator is one of the biggest limitations of this work. Obviously, there is no one way to measure (in)equality, and every framework will likely have important gaps. When designing the indicators, we received suggestions from government partners and more than 100 community members to include more indicators, although there was no clear consensus on what they might be. We had to limit the scope to six themes and 96 indicators, however, due to practical considerations of replicability over time (and in keeping with the feedback



from our experts). Although limited in scope, we tried to minimize the indicator selection bias by incorporating and synthesizing often divergent feedback so the framework reflects what policy-makers, academics, and community members can most agree on. This Community Based Participatory Method gave us greater confidence that the indicators serve as viable proxies for major inequalities in those areas. While *race and high school academic performance*, for example, may not be directly comparable to *gender and representation in government*, the former is a proxy for inequalities in *High School Education* and the latter is a proxy for inequalities in *Political Power*. This methodology limits our ability to compare across areas and we are unable to directly compare different indicators within a given year; however, the primary goal of the Equality Indicators is to measure change over time. In future years, we will be able to compare change or lack of change across indicators, topics, themes, and even cities.

A related issue is that of weighing. Although it is likely that some measures bear greater relevance to equality, the framework assumes that each indicator contributes equally to topic, theme, and citywide scores. We also chose not to give specific indicators, topics, or themes more weight than others in order to avoid making additional subjective determinations about their relative importance.

Another limitation is our inability to capture the same time period for all indicators. While our public survey was conducted in July 2015, and many other indicators covered 2015, for others the most recently available data was for 2014 or 2013. Yet minimizing the time lag to even this 2 years was achieved at the expense of dropping a number of indicators for which only 2012 or older data were available. In 2016, we will collect data for the 2014–2016 period, and every year afterwards will follow the same principle.

Despite these and other limitations, the proposed framework offers a new way to think about inequalities as experienced by various disadvantaged groups using an indicator methodology (Kutateladze and Parsons 2014; Vera Institute of Justice 2003). Our baseline findings from NYC show that they are numerous. This framework also offers a holistic, cross-sectional view of inequality, thus illustrating the need for collaborative action across agencies. The addition of dynamic scores in years to come will further enable these connections to be made, and clearer policy links to be identified and recommended. These scores will also show where progress has stalled and where instead of progress there has been regress, which will aid in pinpointing where resources might be most effectively dedicated. As the tool expands to other cities—work currently underway—we will be able to compare overlapping indicators in different cities and see which local initiatives are most effective in tackling the measured inequality, in addition to comparing overall and domain-specific progress toward equality in each city. Finally, much of the value of this tool also lies in the diversity of the audiences it can serve: it can keep communities better informed about changes in equality so they can hold elected officials more accountable for their performance; it can help government and independent policy groups to develop more data-informed solutions; and it can aid the academic community in identifying new research questions and methods for studying inequality.

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