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Assessing the Health of Local Journalism Ecosystems:

A Comparative Analysis of Three New Jersey Communities

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#journalismgaps

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Acknowledgments

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Executive Summary

This research examines the health of the local journalism ecosystems in three New Jersey communities: Newark, New Brunswick, and Morristown. The goal of this research is to develop and apply a set of reliable, scalable performance metrics intended to inform funders, policymakers, researchers, and industry professionals about the state of journalism in local communities and, ultimately, its connection to healthy democracy, and to help guide decision-making about possible areas of intervention.

This report begins by defining the contours of a local journalism ecosystem and distinguishing the notion of a journalism ecosystem from other commonly employed ecosystem concepts such as media ecosystem and communication ecosystem. This report then presents a three-level conceptual and methodological framework for assessing the health of local journalism ecosystems. This analytical framework focuses on Infrastructure (the availability of journalistic sources), Output (the quantity of journalistic output from these sources) and Performance (the extent to which this output is original, is about the local communication, and addresses critical information needs).

This report then applies this analytical framework to the three selected New Jersey communities through a content analysis of a one-week sample of news stories posted on the web and social media posts provided by the journalistic sources identified in each community. The results indicate substantial differences in the journalism infrastructure output and performance across these three communities, particularly when controlling for differences in population size. Across the majority of the measures of journalistic output and performance utilized, Newark ranked the lowest and Morristown ranked the highest, with New Brunswick consistently falling in the middle. Thus, for instance, Morristown possesses more than ten times as many local journalism sources per 10,000 capita than Newark. And, during the measurement period, Morristown journalism sources produced 23 times more news stories and 20 times more social media posts per 10,000 capita than Newark journalism sources, and 2.5 times more news

stories and 3.4 times more social media posts per 10,000 capita than New Brunswick journalism sources. New Brunswick journalism sources produced 9.3 times more news stories and six times more social media posts per 10,000 capita than Newark journalism sources.

The production of stories addressing "critical information needs" (Friedland et al., 2012) per 10,000 capita was almost 35 times greater in Morristown than in Newark; 14 times greater in New Brunswick than in Newark and approximately 2.5 times greater in Morristown than New Brunswick. In terms of social media output from local journalism sources addressing critical information needs, the same disparities per 10,000 capita persisted, with Morristown journalism sources producing almost 33 times more social media posts addressing critical information needs than Newark sources and almost four times more than New Brunswick sources. New Brunswick journalism sources produced almost nine times more social media posts addressing critical information needs per 10,000 capita than Newark sources. Similar disparities emerged when focusing on content that is produced by the outlet and/or that is about the local community

These disparities appear to be a function not only of differences in the relative quantity of journalistic sources and output across these three communities, but also of qualitative differences in this output. That is, a greater *proportion* of the journalistic output in Morristown was original, was about the local community, and addressed critical information needs than was the case in either New Brunswick or Newark, with Newark again lagging behind in terms of the extent to which its journalism output met these criteria.

This analysis also examined the concentration of journalism output across the three communities, in an effort to determine the extent to which the journalism output in these communities is being provided by relatively few sources. In order to accomplish this, the well-known Herfindahl-Hirschman Index (HHI) was applied to the shares of journalism output within each community provided by each of the journalism sources identified. Using this measure, New Brunswick tended to exhibit substantially

higher concentration of journalism output across the various content categories, suggesting that within this community, journalistic output was distributed across a smaller range of sources than was the case in either Morristown or Newark. Newark tended to exhibit the lowest output concentration levels of the three communities, suggesting that one positive aspect of the journalistic output in Newark is that it is relatively more evenly distributed across available journalistic sources.

These findings potentially point to a specific type of problem in local journalism, one in which lower-income communities are dramatically underserved relative to wealthier communities, and in which lower-income communities receive the bulk of their news from a smaller range of sources. It would be very interesting to see, if this research design were to be scaled up and applied to a larger sample of communities, the extent to which these patterns persist. Further, at such a larger scale it would be possible to conduct multivariate analyses that could identify with greater specificity the characteristics of individual communities that are predictive of overall levels of journalistic infrastructure, output, and performance. It would also be possible to explore the ramifications of these disparities, in terms of their relationship to constructs that are fundamental to well-functioning local democracies such as voting behaviors and community engagement.

Introduction

The economic challenges confronting local journalism as a result of the technological changes that have taken place in the media sector have been well documented (e.g. Downie & Schudson, 2009; Grueskin, Seave, & Graves, 2011; Waldman, 2011). Traditional business models have been undermined as advertisers have utilized alternative means of reaching audiences, and audiences have employed alternative means of accessing the news (Anderson, Bell, & Shirky, 2012). At the same time, however, these technological changes have created opportunities for new and different journalistic sources to develop (Fancher, 2011; Picard, 2014). The lower barriers to entry and minimal distribution costs afforded by the Internet, along with the associated opportunities to harness various forms of user generated content and to develop new tools for audience engagement, have created an environment for innovation and experimentation in the journalistic sphere that is perhaps unprecedented (e.g., *New York Times,* 2014).

The question of whether the net impact of these changes has been positive or negative in terms of the availability of journalism serving local communities' critical information needs remains difficult to answer (Picard, 2014). Some argue that the breakdown of traditional journalistic organizations has been more than compensated for by the rise of various forms of citizen, participatory, and community journalism (Benkler, 2006; Gillmor, 2004; Shirky, 2008). Others contend that local journalism is essentially collapsing, with the decline and (in many cases) disappearance of traditional news outlets leaving massive unfilled gaps (what Stites [2011] has termed "news deserts"; see also Ferrier's [2013] analysis of "media deserts") that create tremendous opportunities for political and corporate corruption to flourish and that undermine effective democratic participation (Starr, 2009). And, of course, the nature of the net effect may vary according to the characteristics (demographic, economic, political, technological) of individual communities (e.g., Pew Research Center, 2015).

Into this complicated and uncertain environment, a few foundations have stepped in, in an effort to support and incubate new and innovate ways of producing and disseminating local journalism, with an eye toward identifying sustainable economic models (e.g., Duros, 2014; Fancher, 2011; Knight Commission, 2009). Similarly, policymakers have begun to recognize that the health of local journalism may merit policy interventions; or at the very least may require systematic monitoring and a more detailed understanding of the dynamics of how local journalism is produced, disseminated, and consumed (Hindman, 2011; Waldman, 2011; Friedland, et al., 2012). Underlying these interventions and inquiries is the recognition that local journalism is essential to well-functioning local democracies (e.g., Firmstone & Coleman, 2014).

What these decision-makers have been lacking, however, are analytical tools for assessing the health of local journalism in individual communities. Other areas of public interest, such as economic development, the environment, political participation, and community engagement have reasonably well developed tools for assessing the health of local communities (e.g., Community Health Status Indicators Project Working Group, 2009; Sustainable Jersey, 2013). The same level of tool development has not been the case, however, for journalism. As journalism researchers noted a decade ago, "our most pressing challenge is to provide comprehensive analyses of the current dynamics of news production, circulation and use in the digital public sphere" (Domingo, Masip, & Meijr, 2004, p. 1). This challenge remains largely unmet.

There have been some tools developed to help assess and address the information health of local communities. For instance, the Knight Foundation (2009) developed a Community Information Toolkit, which provided a methodology for community members to assess the strengths and weaknesses of their information environment. The scope of the Community Information Toolkit was quite broad; extending well beyond journalism to also facilitate the assessment of information provided by local government, health care, and public service providers, as well as an assessment of broadband infrastructure. At the

same time, it was also somewhat superficial, in that much of the assessment process involved answering a series of yes or no questions. Along related lines, the FCC recently attempted to move forward with an effort to assess how well communities' "critical information needs" were being met, only to have to scuttle the work under pressure from some members of Congress and various industry associations (Flint, 2014). More recently, the Pew Research Center (2015) has produced a thorough analysis of the local news ecosystems in three communities of different sizes; however, the scope and depth of the analyses would be difficult and costly to scale up to a degree that would allow for the analysis of a larger sample of markets, and more generalizable findings. Thus, there remains a gap in terms of a robust, but reasonably simple and scalable, analytical approach to assessing the health of local journalism that could be utilized by foundations, policymakers, researchers, and industry professionals to efficiently and cost effectively analyze large numbers of communities.

This research attempts to fill this gap, through the development and application of a multi-level conceptual and methodological framework for assessing the health of local journalism. The development of robust and reliable measures of the health of local journalism would provide a valuable analytical tool for news organizations, funders of journalism initiatives, and policymakers seeking to determine the effectiveness of existing policies or the need for additional policy interventions. Such measures could serve as a meaningful indicator of the extent to which local communities possess an adequate journalistic infrastructure to function effectively as a democracy. They could also serve as a baseline for additional research on the relationship between the health of local journalism and other aspects of community health, such as civic engagement, political participation, and effective local governments.

This report outlines a conceptual and methodological framework for assessing the health of local journalism ecosystems and presents the results of the application of this framework to three communities in New Jersey (Morristown, New Brunswick, and Newark). New Jersey is a state with geographic characteristics that make the provision of local news both particularly important and

particularly challenging (McCollough & Anderson, 2013; Weingart, 2009). New Jersey is characterized by its large number of small municipalities – 565 in total – each with its own governing body and budget (Mulvaney, 2014). Thus, from a political standpoint, one could characterize New Jersey's democratic structure as intensely local, and thus the need for robust local journalism is particularly pronounced. New Jersey therefore represents a particularly important context for trying to develop a means of gaining a deeper understanding of the health of local journalism.

However, the state is bordered on the north and south by large, out-of-state media markets (New York City and Philadelphia), and lacks a large media market of its own (Hale, 2013; Starr, Weingart & Joselow, 2010). As a result, most of the large commercial journalistic outlets available in the state are oriented primarily to out-of-state audiences; nonetheless, these outlets are capable of diverting audience attention and revenues away from local media, thereby undermining the support structure for New Jersey-based journalism (e.g., Starr, Weingart, & Joselow, 2010). Clearly, then, for the state of New Jersey, the health of local journalism is both particularly important and precarious.

This first section of this report describes the concept of "ecosystem analysis" in greater detail and describes the specific type of ecosystem that is the focus of analysis here. The second section describes the conceptual and methodological approach employed. The third section presents the findings. The final section discusses the implications of these findings.

The Parameters of Ecosystem Analysis

In communication and media research, the concept of a media/information "ecosystem" has been increasingly employed in recent years, no doubt due to the growing recognition of the networked nature of information in the digital age (Anderson, 2013; Napoli, Stonbely, Friedland, Glaisyer, & Breitbart, 2012). Ecological studies of media and communications systems go by many names, and have been performed by scholars in a range of disciplines - from science and technology researchers using Actor Network Theory, to sociologists who focus on the "field," to computer scientists using graph theory.

In some cases, research in this vein references a "communications ecosystem" (e.g., Peace, Goodstadt, & Agarwal, 2011). In other cases, the notion of a "media ecosystem" is employed (Napoli, et al., 2012). In still others, phrases such as "news ecosystem" (e.g., Pew Research Center, 2010) or "journalism ecosystem" (e.g., Lewis, 2010) are used.

The model in Figure 1 presents a series of concentric circles which, from the center moving outward, are meant to illustrate a series of increasingly broadening ecosystem parameters. The logic here is that, starting from the center and moving outward, we begin with the most narrowly focused analytical orientation.

The innermost circle represents the *news* ecosystem. This is the ecosystem oriented around the reporting of current events; and is thus comprised of the individuals and organizations engaged in these activities, across all of the interconnected platforms they utilize for doing so. It is important to recognize that the notion of news represents something subtly but significantly different from the notion

Figure 1: Community Information Ecosystem Layers
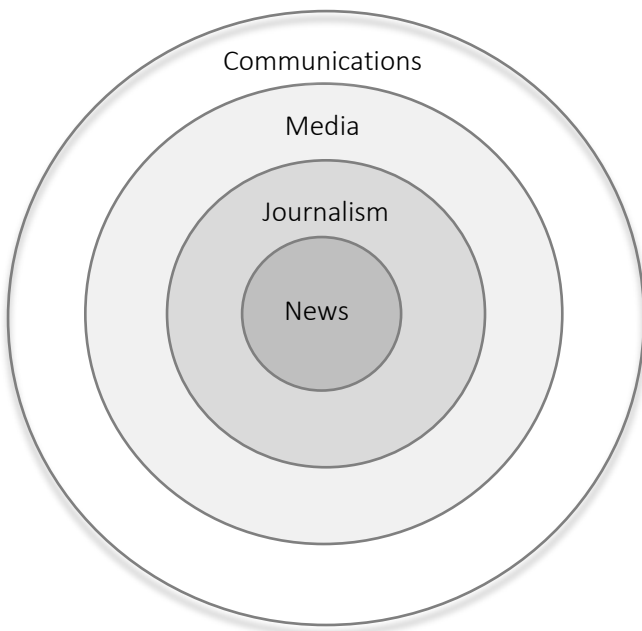
of journalism (the next concentric circle). As Clarke (2014) notes, "while 'journalism' and 'news' are often used interchangeably . . . the two terms should not ordinarily be conflated" (p. 18). As Clarke (2014) and others argue, news is best thought of as a subcategory of journalism. The former is focused on the reporting of current events; while the latter is more broadly focused, to also encompass content types such as current affairs, documentaries, commentary, and analysis.

As should be clear, then, the notion of a news ecosystem is nested within a larger *journalism* ecosystem. Of course, the notion of what constitutes journalism is certainly amidst a process of revision; one in which traditional, narrow perceptions of how, where, and by whom journalism is produced are necessarily being revised (e.g., Fico, et al., 2013; Shapiro, 2014; Williams & Delli Carpini, 2011). However, there is comparative stability in terms of what might be considered "acts of journalism" (Stearns, 2013). Regardless of how or by whom produced, the parameters of journalistic output can still be fairly explicitly defined. Thomas Kent of the Associated Press (cited in Stearns, 2013) has offered an explicit set of criteria for what constitutes journalism, in the form of seven questions. These are:

1. Is the person's product intended for the general public?

2. Is the work creative and analytical rather than a simply relay of raw information?

3. Is the reporting based on facts rather than fabrications? Are statistics, honest images unmanipulated, quotations, correct?

4. Does the product convey multiple points of view?

5. Does the person or his organization guard against conflicts of interests that could affect the product? If conflicts are unavoidable, are they publicly acknowledged?

6. Does the person reveal his or her identity and contact information?

7. Does the person publicly correct errors?

This set of questions is instructive in that it helps to illustrate a set of parameters via which journalism can be defined and distinguished from other types of informational content that may be available. In this way, the journalistic ecosystem can be articulated as something distinct within a defined community.

The analytical scope broadens further at the *media* ecosystem layer. This layer contains both the journalism and news ecosystem, but also accounts for the content and associated providers that extend beyond the boundaries of journalism. This might include, for instance, cultural or entertainment content delivered via various media platforms. Or it might include content that is more instructive/informational

in nature, such as that from a library or a transit authority, rather than meeting the criteria of news or journalism per se. And so once again, the analytical framework broadens to include additional individuals or organizations whose outputs meet these more expansive criteria.

Further, via the *media* terminology, the technologies involved in the production, dissemination, and consumption of content (such as journalism) become integrated into the analytical framework a bit more explicitly. As Adam (2008) argues, "the term 'media' pushes technology into the foreground and conceals the fact that 'journalism' is one thing and 'media' is another. The latter refers mainly to technologies of various effects and uses" (p. 1). Clearly, then, the notions of the journalism and media ecosystems should not be considered synonymous; and thus they are represented as separate analytical layers in our model, with the journalism ecosystem nested within the broader media ecosystem.

Finally, we reach the *communications* ecosystem layer. At this layer, the analytical frame extends beyond mediated forms of communication, to also include the communication that takes place via interpersonal and community networks (e.g., Kim & Ball-Rokeach, 2006). This analytical approach takes both mediated and interpersonal forms of communication into consideration.

Within the context of this schema, the present analysis focuses on the journalism ecosystem. We recognize that an approach that focuses on journalism omits a range of important sources of information in a community (e.g., libraries, local government web sites). However, given the extent to which this analysis is motivated by concerns regarding the health of local journalism, given the technological and economic changes that have potentially affected its viability (see above), it is these concerns that have served as the basis for delineating the analytical focus.

Assessing Infrastructure, Output, and Performance of Local Journalism Ecosystems

For this analysis, the notion of the health of a local journalism ecosystem has been broken down into three connected conceptual layers – a) the journalistic infrastructure; b) journalistic output; and c) journalistic performance. Each of these conceptual layers, and the data gathering and analysis associated with them, are discussed in more detail below.

The analysis of these three layers of ecosystem health has been applied to three New Jersey communities. These communities were selected in an effort to maximize the diversity of types of communities represented in this analysis, within the obvious confines of being limited to three communities. These communities are substantially different from one another in terms of their size, demographic composition, and geographic location within the state. These criteria were identified as critical to the dynamics of local news in New Jersey within previous studies (Hale, 2013; Starr, Weingart & Joselow, 2010). Generally, Newark is the largest, poorest, and most ethnically diverse of the three communities, while Morristown is the smallest, wealthiest, and least ethnically diverse. New Brunswick falls somewhat in between, but with a demographic profile that is closer to Newark's than it is to Morristown's and with a population size that is closer to Morristown's than to Newark's. Generally, we expect the health of local journalism ecosystems to be affected, to some extent, by the characteristics of the communities in which they operate, though we have not put forth any explicit hypotheses within the context of this exploratory analysis. More detailed profiles of each community can be found in Appendix A.

Assessing Journalistic Infrastructure

A key dimension of the health of any local journalism ecosystem is the extent to which a community is served by organizations and/or individuals producing local journalism. This study begins by looking at the journalistic *infrastructure* in each of the three communities. We operationalize the

journalistic infrastructure in terms of: 1) the number of journalistic sources in a local community; and 2) the social media presence of these journalistic sources.

A starting point for this assessment involves counting the number of sources of journalism within a particular community. Such an activity has become more complicated than it once was. Obviously the increased volatility of this sphere, brought about by the rapid technological and economic changes discussed above, is a factor. Keeping pace with the profile of any local journalism ecosystem is much more challenging in this time, during which various journalistic initiatives are rapidly entering and exiting this space.

Given the inadequacy of available commercial or governmental data sources, any effort to create an inventory of the sources of local journalism serving a community is, to some extent, an ad hoc endeavor. For this analysis, we established a concrete, multi-stage data gathering protocol, in order to provide as much clarity and transparency about the process as possible. The process draws from – and to some extent combines – approaches employed in previous research. It involves consultation with the most authoritative relevant directories available, and supplements these consultations with a systematic search and discovery process that involves both online searching and engagement with members of the communities being studied.

The source categories are derived from previous research that has sought to provide comprehensive portraits of the media or journalism ecosystems in local communities (e.g., Durkin & Glaisyer, 2011; Durkin & Hadge, 2010; Gloria & Hadge, 2010; Morgan, 2011; Project for Excellence in Journalism, 2010;). The broad categories for concern here are: a) Television; b) Radio; c) Online; d) Print.

It is also important to emphasize that the focus of this research is on the *local* journalism ecosystem, which is defined in terms of the geographic boundaries of the three communities being studied. Thus, this analysis is focused on the journalism sources that reside within, and are oriented around serving, the three selected communities (e.g., Lin & Song, 2006).   This approach excludes

journalistic sources based and/or focused elsewhere, or more broadly, which are accessible within these communities.   The focus here is explicitly on *local journalism sources based in and serving these geographically defined communities.*   The search process for identifying relevant journalistic sources is detailed in Appendix B.

Through this process it is possible to create an inventory of the available, active sources of journalism in a community. The sources identified for each community are listed in Appendix C.[1] Given that communities differ in size and resources, it is obviously important to not employ the raw number of sources as the relevant metric for the health of a local journalism ecosystem – particularly if the metric is going to be employed for any type of comparative analyses across communities. Larger communities presumably can – and probably should – support larger, more robust journalism ecosystems. Thus, utilizing population data, we computed the *number of outlets identified per 10,000 capita* to produce a comparable measure of the prevalence of journalistic sources in a particular community. This approach draws from similar approaches employed in nutrition research that examines the availability of food sources in particular communities (see, e.g., Powell & Bao, 2008). Work in this vein also has been an important source of inspiration for "media deserts" research (e.g. Ferrier, 2013).

Of course, in the contemporary journalism ecosystem, social media play a vital role in facilitating interconnectedness and sharing of journalistic content (Pew Research Center, 2014).   From this standpoint, an assessment of the social media presence for each journalistic source has been incorporated into the analytical framework as well. Facebook and Twitter have emerged as the most prominent news sources in social media (Pew Research Center, 2014). Thus, for this level of analysis, each journalistic source was evaluated in terms of whether it has a presence on each of these two platforms. It is important to emphasize that the primary unit of analysis for each part of this analysis is ultimately the community as a whole, rather than the individual outlet. So, in this case, aggregate measures were calculated for each community. For instance, a community with 15 journalism sources

would have a maximum potential raw score of 30 (number of sources potentially on Twitter + number of sources potentially on Facebook). The total count would be divided by the maximum potential score to determine *the proportional presence of the community's journalistic sources on social media.* This measure is intended as a basic indicator of the overall social media presence of a community's journalistic sources (more detailed analyses of social media activity are incorporated into the Output and Performance layers as well – see below).

Assessing Journalistic Output

The logical question that arises from the Infrastructure assessment described above is: how much journalistic output does the infrastructure generate? Thus, the Output Layer is focused on assessing the aggregate journalistic output within a selected community, within a specified period of time. The question here is one of quantity (the qualitative dimension is taken up in the Performance Layer), as it would seem that a reasonable indicator of the health of a local journalism ecosystem is the amount of journalism that is produced for the community.

For this analysis, a one-week sample of home pages[2] and social media accounts (Twitter and Facebook)[3] for each journalistic source was content analyzed to determine the overall volume of journalistic output available on these platforms.[4] A total of 1028 stories and 1651 social media posts were analyzed across the three communities. Again, controls (per 10,000 capita) were employed for these output measures to account for variations in the size of the communities, under the logic that larger communities should generate more newsworthy activity and also be served by more journalism outlets. For this output, *measures of concentration were calculated, using the well-known Herfindahl-Hirschman Index (HHI),* to determine the extent to which journalistic output is dispersed across available sources or highly concentrated within a select few.[5]

It is important to emphasize that the methodological approach employed for this section's analysis—and the section that follows, relies on the journalistic content available online, regardless of the outlet's "native" platform. Thus, the journalistic outputs of daily and weekly newspapers, magazines, radio stations, television stations, and local cable channels all are assessed via their online content offerings in the same way that the outputs of online news sources such as community journalism sites are assessed.

This approach runs counter to the common assertion that certain types of legacy media (e.g., local weekly print publications, ethnic media outlets) remain slow to utilize the Internet as a means of disseminating their content. We believe that we are at a point in the evolution of legacy media and their place within the broader media ecosystem that this generalization likely no longer holds true. The economic and strategic pressures and incentives to have an online presence, combined with the inherent economic imperative to distribute content production costs across as broad an audience base as possible (Hamilton, 2004), we believe mean that the content available online can serve as a reliable *indicator of the relative journalistic output* across individual outlets, regardless of their "native" platform. The key term here is *indicator,* as we are not seeking to produce a comprehensive inventory of journalistic output, only a set of indicators that are conceptually and methodologically robust and that can be employed in comparative analyses across communities or over time. It is worth noting that data gathered on the three selected communities revealed only one journalistic source in each community that did not have a corresponding online presence. Further, a preliminary analysis of the web sites for radio stations serving the three communities found that the quantity of journalism available on these sites varied in a way that reflected the stations' journalistic orientations (i.e., news/talk radio stations' web sites containing much more original journalistic output than music stations).

Assessing Journalistic Performance

At the Performance Layer, the goal is to provide indicators of the extent to which the local journalism ecosystem is producing content that addresses the communities' information needs. Thus, at this stage the content identified in the Output Layer is analyzed to determine the extent to which it is original, (as opposed to linked or aggregated from other sources) the extent to which it is about the local community, and the extent to which it serves communities' critical information needs. We use these criteria as an admittedly rough indicator of the complex notion of the "quality" (Lacey & Rosenstiel, 2015) of the journalism being produced by these sources.

Given the centrality of the notion of *critical information needs* (CINs) to the ongoing discourse about the performance of local journalism (Knight Commission, 2009; Waldman, 2011), the approach employed here builds upon this concept, and the research it has inspired (Friedland, et al., 2012). Specifically, in an effort to provide a relatively simple and straightforward indicator of journalism ecosystem performance, the approach employed here involves content analyzing each story/post identified in the Output Layer to determine whether it fits into one or more of the critical information needs categories identified in Friedland, et al.'s (2012) comprehensive review of the literature that was prepared in order to provide guidance to the Federal Communications Commission for future empirical work. Friedland et al. (2012) provide eight categories of community critical information needs. These categories, and their associated definitions, can be found in Table 1. These categories provide a comprehensive and relatively straightforward schema for content analyzing local news stories/posts. It is important to note that while the extent to which the news/information had a local orientation was a part of Friedland et al.'s (2012) category definitions, for this analysis, we have employed a somewhat modified approach, in which the notion of critical information needs applies to broad content categories (e.g., education), regardless of their geographic orientation, as we sought to be able to separate the

assessment of whether a story addresses a critical information need category from the assessment of whether the story had a local orientation (see below).

Toward this end, each story/post also was content analyzed in terms of whether it was about the local community as well as in terms of whether it was original. The emphasis here on original content is intended to separate aggregation, linking, sharing, retweeting, and re-publication activities, in an effort to determine the amount of *original journalism output being provided to individual communities* (e.g., Pew Research Center, 2010). The emphasis on locality is employed in order to facilitate analysis of the extent to which the *output of local journalism sources is oriented around the local community.* Both of these criteria are fundamental dimensions of the health of a local journalism ecosystem.

Content analysis of the news stories presented on home pages and social media posts was conducted by three trained coders. Pilot tests for both the web site and social media content analyses were conducted in order to identify data gathering challenges and difficulties interpreting or applying the coding categories. The coding sheets are included in Appendix D. Google Translate was used to facilitate coding of foreign language content (both Spanish and Portuguese language content were part of the analysis). More details about the coding process can be found in Appendix E.

As has been the case at each stage, concentration across journalistic sources was used to determine the extent to which journalistic output was emanating from many or few local sources. And, as with previous stages in the process, controls (per 10,000 capita) were employed to produce comparative metrics that account for differences in population sizes across communities. With these data it is possible to compute the proportion of stories/posts that address critical information needs, as well as to focus on stories/posts that are original, or that are about the local community (or various combinations of these categories).

Table 1: Inventory of Community Information Needs (adapted from Friedland, et al., 2012).

1. Emergencies and risks
Individuals, neighborhoods, and communities need access to emergency information on platforms that are universally accessible and in languages understood by the large majority of the local population, including information on dangerous weather; environmental and other biohazardous outbreaks; and public safety threats, including terrorism, amber alerts, and other threats to public order and safety. Further, all citizens need access to information on policing and public safety.

2. Health
All members of communities need access to information on health and healthcare, including information on family and public health in accessible languages and platforms; information on the availability, quality, and cost of health care for accessibility, lowering costs, and ensuring that markets function properly, including variations by neighborhood and city region; the availability of public health information, programs, and services, including wellness care and clinics and hospitals; timely information in accessible language on the spread of disease and vaccination; timely access to information about health campaigns and interventions.

3. Education
Communities need access to information on all aspects of the educational system, particularly during a period when education is a central matter for public debate, decision-making, and resource allocation, including: the quality and administration of school systems at a community-wide level; the quality of schools within specific neighborhoods and geographic regions; information about educational opportunities, including school performance assessments, enrichment, tutoring, afterschool care and programs; information about school alternatives, including charters; information about adult education, including language courses, job training, and GED programs, as well as opportunities for higher education.

4. Transportation Systems
All members need timely information about transportation across multiple accessible platforms, including: information about essential transportation services including mass transit at the neighborhood, city, and regional levels; traffic and road conditions, including those related to weather and closings; timely access to public debate on transportation at all layers of the community, including roads and mass transit.

5. Environment and Planning:
Communities need access to both short and long-term information on the environment, as well as planning issues that may affect the quality of lives in neighborhoods, cities, and metropolitan regions, including; the quality of local and regional water and air, timely alerts of hazards, and longer term issues of sustainability; the distribution of actual and potential environmental hazards by neighborhood, city region, and metropolitan area, including toxic hazards and brownfields; natural resource development issues that affect the health and quality of life and economic development of communities; information on access to environmental regions, including activity for restoration of watersheds and habitat, and opportunities for recreation.

6. Economic Development
Individuals, neighborhoods, and communities need access to a broad range of economic information, including: employment information and opportunities within the region; job training and retraining, apprenticeship, and other sources of reskilling and advancement; information on small business opportunities, including startup assistance and capital resources; information on major economic development initiatives affecting all community levels.

7. Civic Information
Communities need information about major civic institutions, nonprofit organizations, and associations, including their services, accessibility, and opportunities for participation in: libraries and community-based information services; cultural and arts information; recreational opportunities; nonprofit groups and associations; community-based social services and programs; and religious institutions and programs.

8. Political Life
In a federal democracy, citizens need information on local, regional, county, state, and federal candidates at all units of governance, including: information on elected and voluntary neighborhood councils; school boards; city council and alder elections; city regions; and county elections; timely information on public meetings and issues, including outcomes; information on where and how to register to vote, including requirements for identification and absentee ballots; information on state-level issues where they impact local policy formation and decisions.

Results

This section provides a basic overview of the study's main findings. More detailed tabular presentations of the results can be found in Appendix F. Table 2 presents some general descriptive data about each of the three communities, such as population, number of journalism sources identified, number of sources per 10,000 capita, and the proportional participation of these sources on the two major social media platforms (Facebook and Twitter). These data speak to the relative health of the Infrastructure Layer of the local journalism ecosystems across these three communities.

Table 2: Descriptives

Town	Population	Per Capita Income	# Journalism Sources	Sources/10k	Social Media Presence Score
Newark	277,00	$13,009	16	.58	80
New Brunswick	55,000	$16,395	13	2.36	81
Morristown	18,000	$37,573	11	6.11	68

One point worth noting in this table is the substantial variation in the number of sources per 10,000 capita across these three communities. As the table indicates, the smallest, wealthiest community (Morristown) has, proportionally, substantially more journalism sources than the largest, lowest-income community (Newark), with New Brunswick situated between the these two communities in terms of population, per capita income, and sources per 10,000 capita.[6] As we will see, this disproportionate availability of local journalism sources dramatically impacts the volume of journalism output across these three communities (see below).

Next, we look at the overall levels of journalism activity across the three communities. Here, we control for population size in order to have a relative sense of the quantity of journalism output being produced, both in overall terms and in terms of journalism meeting the various criteria – and combinations of criteria – discussed above (e.g., original, about community, meeting critical information

needs). We look first at our analysis of stories available on the journalism sources' home pages. We then turn to the journalistic output on social media platforms

Web Sites

Figure 2 depicts the differences in journalistic output across the three communities, with a focus on the news stories that were present on the home pages of the sources located within each community. This graph provides breakdowns across each individual coding category, as well as all combinations of coding categories. At the most basic level (the top category in the graph) – stories per 10,000 capita – we can see that Morristown journalistic sources presented nearly 200 stories per 10,000 capita in the sample week, compared with less than ten for Newark and approximately 80 for New Brunswick.

Figure 2: Journalistic Output Per 10,000 Capita Across Three NJ Communities (Web Sites)
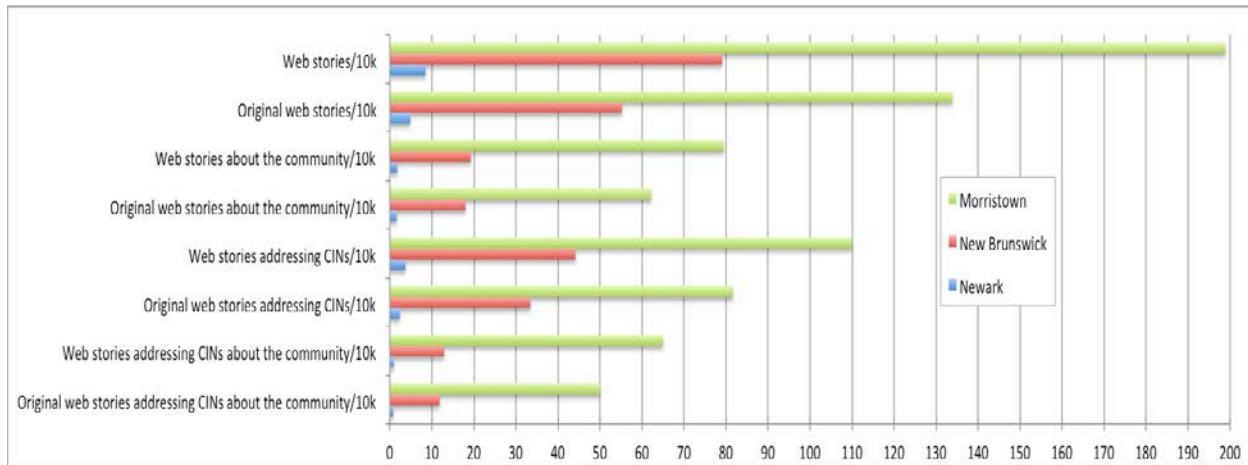
As we work our way down the graph, we see that this pattern persists for each way in which the story output was filtered. Thus, for instance, Morristown journalism sources produced over 130 stories per 10,000 capita that were coded as Original, compared with just over 50 for New Brunswick and less than ten for Newark. At the very bottom of the graph, we focus on stories that met all three of the coding criteria (stories that were original, about the community, and that addressed a critical information

need). When these filtering criteria are all applied, Morristown journalism sources produced 50 stories per 10,000 capita, compared with just over ten for New Brunswick and less than one for Newark.

Figure 3: "Quality" of Journalistic Output Across Three NJ Communities (Web Sites)
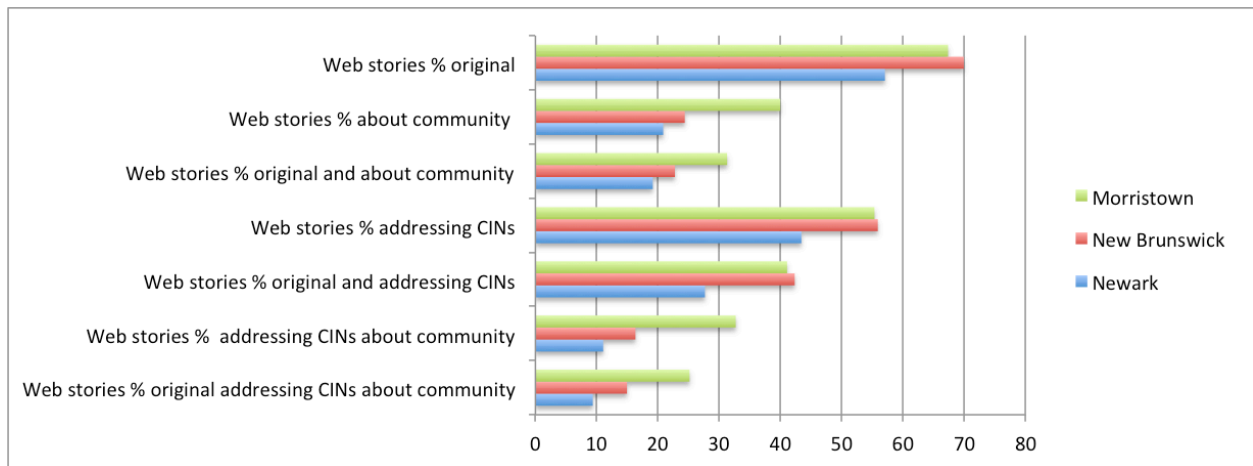
Another way to examine story output is in percentage terms. That is, what proportions of the stories being produced in these communities have met the various criteria? Figure 3 presents these results, showing the proportion of the stories available on the home pages of the journalism sources in each community that met each coding category (individually and in combination). As we can see in Figure 3, some of the patterns seen in Figure 2 persist, though not to the same extreme degree. Morristown journalism output tends to perform better on each of the evaluate criteria than Newark journalism output. New Brunswick journalism output approaches or exceeds that of Morristown in some instances (e.g., % original; % original and addressing critical information needs).

Starting at the top of the graph, for instance, the percentage of news stories produced by Morristown journalism outlets that was original approached 70 percent. In terms of originality, the proportion of news stories produced by New Brunswick journalism sources meeting this criterion was slightly higher (70%). For Newark the proportion was just under 60 percent. As Figure Three also indicates, while over 30 percent of the Morristown news stories analyzed were about the community and

addressed critical information needs, this percentage was less than 20 percent for New Brunswick and just over ten percent for Newark.

Finally, we look at the concentration of the journalistic output found on the home pages for the local journalism sources. As Figure 4 indicates, New Brunswick exhibited consistently higher levels of output concentration than either Newark or Morristown across all of the content coding categories. So, for instance, New Brunswick's HHI for web story output was 4559.18, compared with 2062.20 for Morristown and 1902.58 for Newark. The levels of output concentration in Newark and Morristown tend to be similar. These patterns suggest, compared to Morristown and Newark, a substantially larger proportion of the journalistic output in New Brunswick is produced by fewer sources.

Figure 4: Concentration of Website Stories Across Three NJ Communities
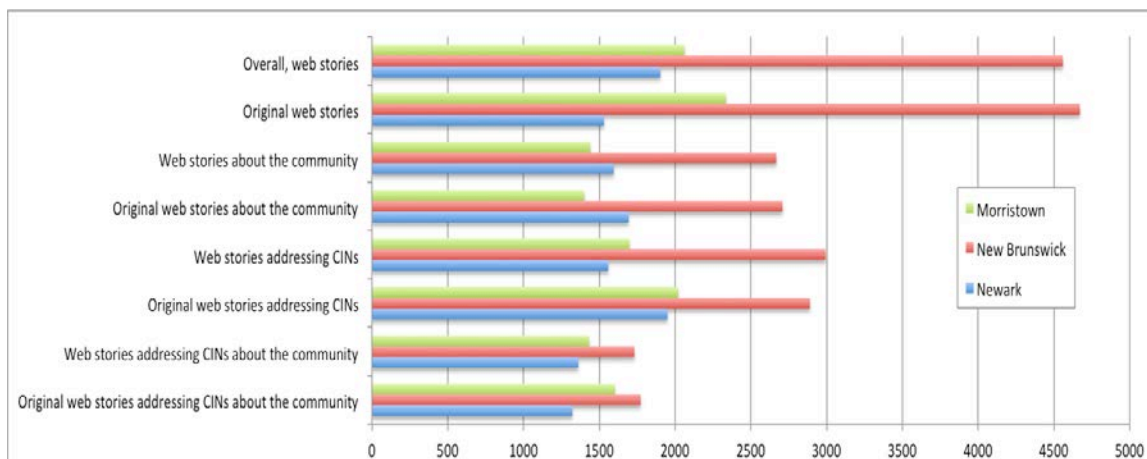
Social Media

We turn next to social media output. Figure 5 presents the same breakdown as Figure 2, with the focus this time on social media posts rather than stories available on the sources' home pages. As should be clear from Figure 5, the same pattern that was found for home page output persists when we focus on the social media output of these journalism sources. The social media output of Morristown's journalism sources far exceeds that of Newark and (to a lesser extent) New Brunswick across all of the coding

categories, ranging from the broadest (posts per 10,000 capita) to the narrowest (original posts about the community addressing critical information needs per 10,000 capita). For instance, Morristown journalistic sources produced over 200 posts per 10,000 capita addressing critical information needs during the measurement period, compared with 60 for New Brunswick and less than ten for Newark.

Figure 5: Journalistic Output Per 10,000 Capita Across Three NJ Communities (Social Media)
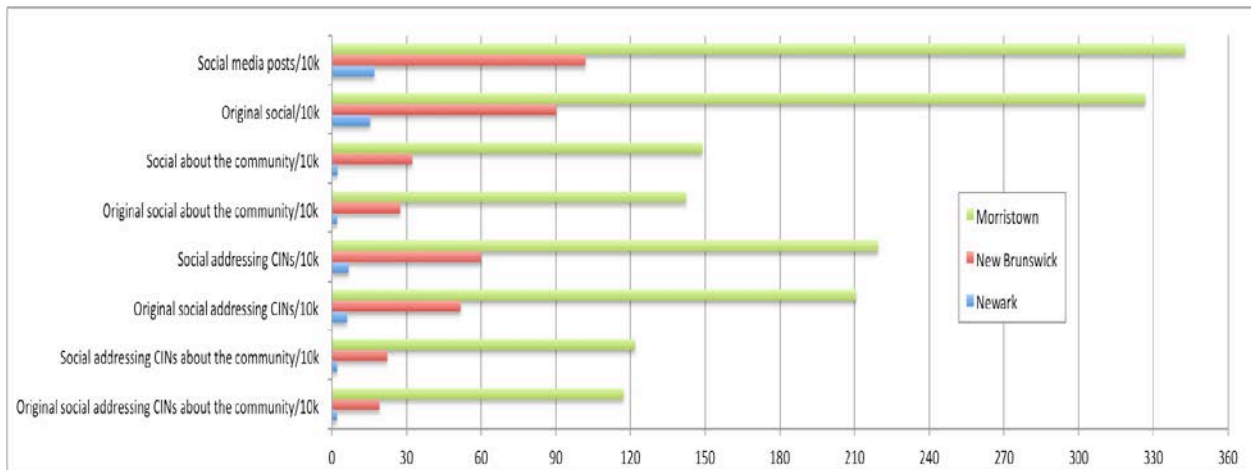
To some extent this pattern persists (though is not as extreme) when we shift our analytical focus from social media posts per 10,000 capita to the proportion of social media posts meeting the various coding criteria. As can be seen in Figure 6, the journalistic sources in the three communities were roughly comparable in the extent to which their social media posts met the originality criteria (all in the 90 percent range). However, when additional criteria were applied to these postings (whether they were about the community, or addressed critical information needs), the Morristown – New Brunswick – Newark high-to-low pattern re-emerged.
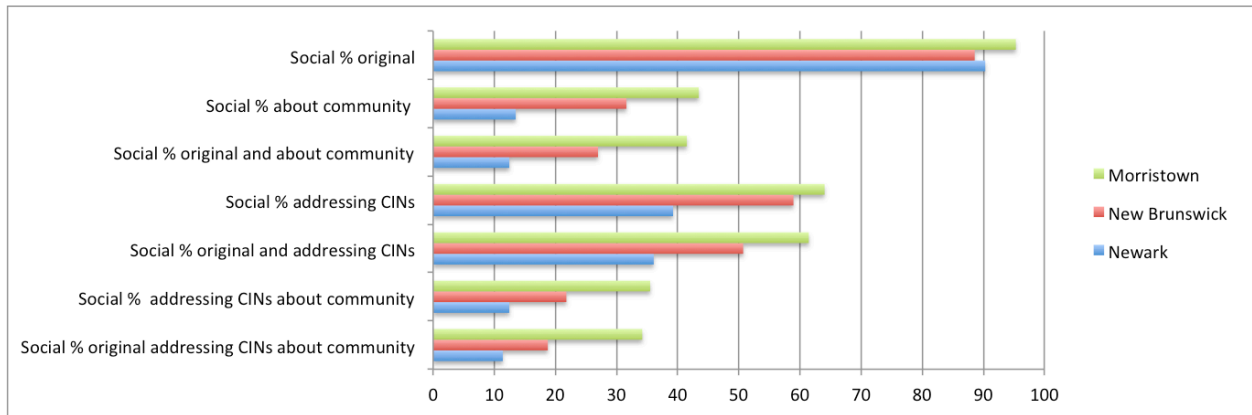
Finally, we turn to journalistic output concentration in the social media context. As Figure 7 indicates, there is a substantial amount of variation across the communities in terms of their relative social media output concentration across the various coding categories. Thus, for instance, while Newark exhibits substantially higher output concentration than either Morristown or New Brunswick in terms of overall social media posts and in terms of original social media posts, when the focus is on posts about the community, or on any of the combinations of content categories, Newark's output concentration is by far the lowest. New Brunswick tends to exhibit the highest levels of social media output concentration across all of these other categories.
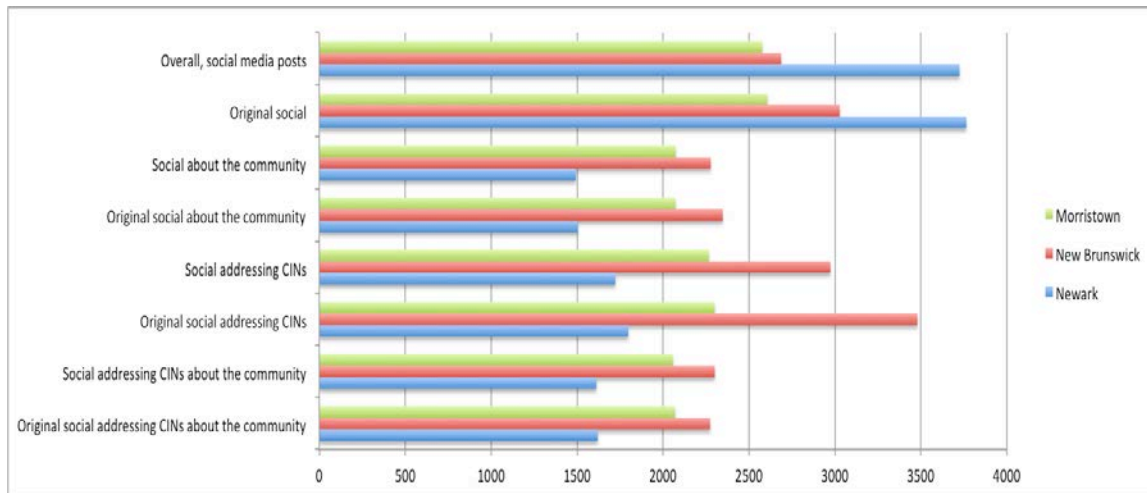
Discussion

This research has focused on developing and applying a set of scalable comparative performance metrics that can be used to assess the relative health of local journalism ecosystems. In designing and testing these metrics on three New Jersey communities, some consistent patterns of disparity were revealed between a small, relatively wealthy, suburban community such as Morristown and a larger, more urban, and significantly less wealthy community such as Newark (and, to a less extreme degree, New Brunswick).

It is important to note that the disparities across communities are a reflection of both the quantity and, to some extent, the "quality" of the journalistic output. From a quantity standpoint, the aggregate of Newark journalism sources lagged far behind Morristown and typically lagged behind New Brunswick in terms of the relative amount of journalistic output disseminated across both social media platforms and the home pages. New Brunswick tended to be positioned between Newark and Morristown across these measures. These differences are a reflection of the substantial disparities in the number of journalistic sources per 10,000 capita found in these communities. Newark has far fewer

journalistic sources per 10,000 capita than either New Brunswick or Morristown, with Morristown also having substantially more journalistic sources per 10,000 capita than New Brunswick.

From a quality standpoint, a *smaller proportion* of the journalistic output in Newark and (to a lesser extent) New Brunswick tended to meet key qualitative criteria, such as originality, focus on the local community, and addressing critical information needs than was the case in Morristown. Thus, not only was there less journalism in the lower-income communities, but also a smaller proportion of this journalism output in these communities met basic criteria for quality when compared to a wealthier community such as Morristown.

These findings potentially point to specific types of problems in local journalism, in which lower-income communities are dramatically underserved relative to wealthier communities. We don't see these patterns as a basis for critique of the performance of the journalism sources in these communities, but rather as indicators of the extent to which the characteristics of individual communities likely affect the health of their local journalism ecosystems.

The obvious question raised by this research is whether these patterns would persist if this analytical approach were scaled up and applied to a larger sample of communities. At such a larger scale it would also be possible to conduct multivariate analyses that could identify with greater specificity the characteristics of individual communities (e.g., size, income, demographics, proximity to larger media markets) that are predictive of overall levels of journalistic infrastructure, output, and performance. Finally, it would also be possible to explore the ramifications of these disparities, in terms of their relationship to constructs that are fundamental to well-functioning local democracies such as voting behaviors and community engagement.

There are a number of possible explanations for the patterns we have observed. It may be that a methodology that relies (as ours does) on journalistic output available online (specifically, on home pages and social media) is missing a greater proportion of journalism output in lower-income communities,

where broadband penetration tends to be lower. Under this logic, the journalism produced in lower-income communities is more likely to still be found exclusively on traditional media platforms (print, radio, etc.). Another possibility is that there is more unattributed duplication of journalistic output happening in wealthier communities (avoiding detection via our content coding process). For instance, in an interview with a Morristown journalist for a related research project, he noted a tendency of competing hyperlocal web sites to present his journalistic output in slightly modified forms, without attributing his site as the original source of the story. Such activities may also contribute to the magnitude of the differences found. It seems unlikely, however, that these factors could, in combination, fully account for the differences found here.

Geographic proximity to a major media market also may be a factor. For instance, the proportionally fewer journalistic sources (and thus lower levels of journalistic output) found in Newark could be a function of the city's greater proximity to New York City (and its vast array of media outlets) than Morristown and New Brunswick. It is also possible that the quantity of Newark-focused journalism generated by these New York City-based outlets substantially reduces the quantity gap found here. However, previous research has shown that New York City-based media outlets devote relatively little attention to New Jersey (Hale, 2013); and presumably only some portion of this coverage would be Newark-focused. Moreover, this same research suggests that New Jersey-focused media coverage originating from New York-based journalism sources tends to focus far more on topics such as crime, fires, and disasters, and far less on topics such as the economy and government affairs than New Jersey-based journalism sources (Hale, 2013). Such differences suggest that journalism originating from outside of the community might not be an effective substitute for true local journalism.

Another possible explanation may be that the differences found are primarily a function of the economic differences across these communities. At one level, it may be simply that it is easier to monetize journalistic content and journalism audiences in wealthier communities. However, it may not

simply be that the business of journalism is more economically viable in higher income communities. It may also be the case that the disparities we found are a function of the fact that the greater economic prosperity in these communities means that there are more individuals/organizations in the position financially to engage with journalism as a non-profit (or even money-losing) community service, and/or that are able to make a long- or short-term investment in a high-risk business venture such as a local journalism initiative. That is, the economic infrastructure to support a public service model of journalism is likely stronger in wealthier communities. This may ultimately exacerbate what appears to be a journalism gap between wealthier and poorer communities as the traditional economic models of journalism continue to erode. This is speculation that could presumably be verified in future research.

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Appendix A: Community Profiles*

Newark is the largest city (by population) in the state of New Jersey, and the county seat of Essex County. One of the nation's major air, shipping, and rail hubs, the city had a population of 277,140 in 2010, making it the nation's 67th most-populous municipality, after being ranked 63rd in the nation in 2000.

Newark is the second largest city in the New York metropolitan area, approximately 8 miles west of Manhattan. Port Newark, the major container shipping terminal in the Port of New York and New Jersey, is the largest on the East Coast.

Newark is headquarters to numerous corporations, such as Prudential Financial, Panasonic Corporation of North America and PSEG. It is also home to several universities, such as Rutgers–Newark (including the law school and medical school), the New Jersey Institute of Technology, and Seton Hall University's Law School.

Newark is divided into five geographical wards, and contains neighborhoods ranging in character from bustling urban districts to quiet suburban enclaves. At the 2010 United States Census, there were 277,140 people, 94,542 households, and 61,641 families residing in the city. The population density was 11,458.3 per square mile. There were 109,520 housing units at an average density of 4,528.1 per square mile. The racial makeup of the city was 26.31% (72,914) White, 52.35% (145,085) Black or African American, 0.61% (1,697) Native American, 1.62% (4,485) Asian, 0.04% (118) Pacific Islander, 15.22% (42,181) from other races, and 3.85% (10,660) from two or more races. Hispanics or Latinos of any race were 33.83% (93,746) of the population.

The Census Bureau's 2006-2010 American Community Survey showed that (in 2010 inflation-adjusted dollars) median household income was $35,659 (with a margin of error of +/- $1,009) and the median family income was $41,684 (+/- $1,116). Males had a median income of $34,350 (+/- $1,015) versus $32,865 (+/- $973) for females. The per capita income for the city was $17,367 (+/- $364). About 22.0% of families and 25.0% of the population were below the poverty line, including 34.9% of those under age 18 and 22.4% of those age 65 or over

New Brunswick is a city in Middlesex County, New Jersey, United States. It is the county seat of Middlesex, and the home of Rutgers University. The city is located on the Northeast Corridor rail line, 27 miles southwest of Manhattan, on the southern bank of the Raritan River. At the 2010 United States Census, the population of New Brunswick was 55,181, reflecting an increase of 6,608 (+13.6%) from the 48,573 counted in the 2000 Census, which had in turn increased by 6,862 (+16.5%) from the 41,711 counted in the 1990 Census. Due to the concentration of medical facilities in the area, including Robert Wood Johnson University Hospital and Saint Peter's University Hospital, as well as Rutgers University's Robert Wood Johnson Medical School, New Brunswick is known as "the Healthcare City," The corporate headquarters and production facilities of several global pharmaceutical companies are situated in the city, including Johnson & Johnson and Bristol-Myers Squibb.

At the 2010 United States Census, there were 55,181 people, 14,119 households, and 7,751 families residing in the city. The population density was 10,556.4 per square mile (4,075.8/km^2). There were 15,053 housing units at an average density of 2,879.7 per square mile (1,111.9/km^2). The racial makeup

of the city was 45.43% (25,071) White, 16.04% (8,852) Black or African American, 0.90% (498) Native American, 7.60% (4,195) Asian, 0.03% (19) Pacific Islander, 25.59% (14,122) from other races, and 4.39% (2,424) from two or more races. Hispanics or Latinos of any race were 49.93% (27,553) of the population.

There were 14,119 households, of which 31.0% had children under the age of 18 living with them, 29.2% were married couples living together, 17.5% had a female householder with no husband present, and 45.1% were non-families. 25.8% of all households were made up of individuals, and 7.2% had someone living alone who was 65 years of age or older. The average household size was 3.36 and the average family size was 3.91.

The Census Bureau's 2006–2010 American Community Survey showed that (in 2010 inflation-adjusted dollars) median household income was $44,543 (with a margin of error of +/- $2,356) and the median family income was $44,455 (+/- $3,526). Males had a median income of $31,313 (+/- $1,265) versus $28,858 (+/- $1,771) for females. The per capita income for the borough was $16,395 (+/- $979). About 15.5% of families and 25.8% of the population were below the poverty line, including 25.4% of those under age 18 and 16.9% of those age 65 or over.

Morristown is a town in Morris County, New Jersey. As of the 2010 United States Census, the town's population was 18,411, reflecting a decline of 133 (-0.7%) from the 18,544 counted in the 2000 Census, which had in turn increased by 2,355 (+14.5%) from the 16,189 counted in the 1990 Census. It is the county seat of Morris County.

At the 2010 United States Census, there were 18,411 people, 7,417 households, and 3,649 families residing in the town. The population density was 6,284.9 per square mile. There were 8,172 housing units at an average density of 2,789.6 per square mile. The racial makeup of the town was 62.50% (11,507) White, 13.97% (2,572) Black or African American, 0.64% (117) Native American, 4.34% (799) Asian, 0.06% (11) Pacific Islander, 14.84% (2,732) from other races, and 3.66% (673) from two or more races. Hispanics or Latinos of any race were 34.09% (6,277) of the population.

The Census Bureau's 2006-2010 American Community Survey showed that (in 2010 inflation-adjusted dollars) median household income was $64,279 (with a margin of error of +/- $5,628) and the median family income was $66,070 (+/- $3,638). Males had a median income of $51,242 (+/- $6,106) versus $44,315 (+/- $5,443) for females. The per capita income for the borough was $37,573 (+/- $2,286). About 10.2% of families and 9.5% of the population were below the poverty line, including 16.1% of those under age 18 and 8.8% of those age 65 or over.

* Source: Wikipedia

Appendix B: Search Protocol for Identifying Local Journalism Sources

Stage 1: Consult Relevant Media Directories

A number of print and online data sources are available to identify media outlets at the local level. Because research has shown that many such directories (including those offered by commercial providers or government agencies) tend to be incomplete, multiple directories were consulted for each source category. Below is a list of the directories consulted for each source category. In each case, searching by the relevant communities (Newark, Morristown, New Brunswick) was relatively straightforward.

Source Directories Employed in Data Gathering

Source	Directory
Television	Community Media Database (http://communitymediadatabase.org) Association of Public Television Stations' Station Directory (http://www.apts.org/local-stations/find-your-local-ptv-stations) FCC Broadcast Television License Database http://www.fcc.gov/encyclopedia/tv-query-broadcast-station-search
Radio	NPR Labs Mapping and Population System http://www.nprlabs.org/maps. FCC AM and FM Broadcast License Database http://www.fcc.gov/encyclopedia/am-query-broadcast-station-search http://www.fcc.gov/encyclopedia/fm-query-broadcast-station-search
Print	Library of Congress Directory of Newspapers http://chroniclingamerica.loc.gov/search/titles/ *Editor & Publisher* International Data Book
Online	Knight Foundation's Directory of Community News Sites http://kcnn.org/citi-media-site/ Columbia Journalism Review's Guide to Online News Startups (http://cjr.org/news_startups_guide/) New Jersey News Commons' Directory of Partners http://njnewscommons.org/category/partners. Online Newspaper Directory for the World (http://www.onlinenewspapers.com/) NJ.com's New Jersey blog directory http://www.nj.com/blogs/)
Multiplatform	National Directory of Ethnic Media

Stage 2: Supplement Directory Data with Manual Search

In order to supplement the data gathered from the directories described above, the second stage of data gathering involved a manual search for relevant journalistic sources.   Following the approach employed by Ramos, et al. (2013), this process involved keyword searches via search engine and then visiting those sites produced by the search queries to identify links to other relevant sources. Further, those sites that were linked to by the original site were subsequently examined to determine whether they contained links to any additional relevant sites. Keyword searches employed the name of the town, county, and region, along with associated media terms such as "news," "blog," "radio," "television." In addition, in instances in which a community is known by a particular nickname (e.g., "Brick City" for Newark), that terminology was employed in the search process as well.

Stage 3: Targeted Interviews with Community Members

In order to identify additional potential sources not identified by Stages 1 and 2, a final step involved integrating an approach employed by the New America Foundation case studies (see, e.g., Morgan, 2011), in which a limited number of targeted interviews were conducted with community members in positions to be well-informed about the journalistic sources serving the local community. Specifically, 3-5 interviews were conducted with individuals in the following categories: 1) local government; 2) local news media; 3) activist organizations; 4) ethnic community organizations. The Stage 3 interviews are meant to act as a confirmation of Stages 1 and 2 and to catch any local outlets that may not have been detected.

Appendix C: Journalism Sources

Newark		New Brunswick		Morristown	
Source	URL	Source	URL	Source	URL
WBGO	http://www.wbgo.org	Rutgers TV	http://rutv.rutgers.edu/	WMTR AM	http://www.wmtram.com/
Newark TV 78	https://www.youtube.com/channel/UCz4xi5mFm9_de70B0egAr4Q	Rutgers Radio	http://radio.rutgers.edu/	WJSV	N/A
Luso Americano	http://www.lusoamericano.com/	WCTC 1450	http://www.wctcam.com/	Tap into Morristown	http://thealternativepress.com/towns/morristown
Newark Star Ledger	http://www.nj.com/starledger/	Magic 98.3	http://www.magic983.com/	Morris News Bee	http://newjerseyhills.com/morris_news_bee/
Glocally Newark	http://glocallynewark.com/	La Costena 103.9	http://www.radiolacostena.com/	Patch Morristown	http://patch.com/new-jersey/morristown
Brick City Live	http://www.brickcitylive.com/	My Central Jersey	http://www.mycentraljersey.com	NJ.com Morristown	http://www.nj.com/morristown/
Newark Pulse	http://www.newarkpulse.com/index.php	Daily Targum	http://www.dailytargum.com/	Morristown Green	http://morristowngreen.com/
El Especial	http://elespecial.com/	Ru Screwd Blog	http://www.ru-screwd.com/	Morristown News	http://www.mypaperonline.com/frontpage-the-morristown-news
Transformation Newark	http://newarknewsonline.com	Muckgers	http://www.muckgers.com/	Morristown 411	http://morristown411.com/
Newark USA blog	http://newarkusa.blogspot.com/	New Brunswick Today	http://newbrunswicktoday.com/	Morristown High School Broadcaster	http://www.mhsbroadcaster.org
Rutgers Observer	https://rutgersobserver.wordpress.com/	Patch New Brunswick	http://patch.com/new-jersey/newbrunswick	The Daily Record	http://www.dailyrecord.com/
Vector – NJIT	http://njitvector.com/	NJ.com New Brunswick	http://www.nj.com/new-brunswick/		
Policy Options	http://www.policyoptions.org/newark/news?sl=0	WNJB-TV	N/A		
WRNU	http://www.wrnu.info/				
Patch Newark	http://patch.com/new-jersey/newarknj				
El Nuevo Coqui	N/A				

Appendix D: Coding Sheets

News Story Coding Sheet

1. UNITID: _____

2. COMMUNITY:____
(1 = Newark; 2 = New Brunswick; 3 = Morristown)

3. News source [SOURCE]:____
       (Enter Source #; See *Source List* document)

4. Date, Month [MONTH]:____

5. Date, Day [DAY]:____

6. Date, Year (last two digits only, e.g. 15) [YEAR]:____
(this is the date on which the content being coded was posted)

7. Story is original (1=Yes, 2=No, 3=Unclear) [ORIGINAL]: _____

8. Primary Critical Info Need topic addressed (1-8; 9 = none/other) [CIN1]:____
       [See *Critical Information Needs Coding Categories* document]

9. Secondary Critical Info Need topic addressed (if more than one) [CIN2]:____
       [See *Critical Information Needs Coding Categories* document]

10. Story is about target community (1=Yes, 2=No, 3=Unclear) [ABOUTCOM]:____

11. Total number of Comments [COMMENTS]:____

12. Total number of Facebook Shares [SHARES]:____

13. Total number of Tweets [TWEETS]:____

14. Notes:

Social Media Coding Sheet

1. UNITID: _____

2. COMMUNITY:____
(1 = Newark; 2 = New Brunswick; 3 = Morristown)

3. News source [SOURCE]:____
　　　　(Enter Source #; See *Source List* document)

4. Date, Month [MONTH]:____

5. Date, Day [DAY]:____

6. Date, Year (last two digits only, e.g. 15) [YEAR]:____
(this is the date on which the content being coded was produced)

7. TIME:_____
(e.g., 22.15, 08.30, etc.)

8. Social media platform [PLATFORM]:____
(1=Facebook, 2=Twitter)

9. Primary Critical Info Need topic addressed (1-8; 9 = none/other) [CIN1]:____
　　　　[See *Critical Information Needs Coding Categories* document]

10. Secondary Critical Info Need topic addressed (if more than one) [CIN2]:____
　　　　[See *Critical Information Needs Coding Categories* document]

11. Post is a retweet/share from another source (1=Yes; 2= No) [RETWEET/SHARE]

12. Post is about target community (1=Yes, 2=No, 3=Unclear) [ABOUTCOM]:____

13. Total number of Likes (Facebook) or Favorites (Twitter) [#LIKES/FAVES]:____

14. Total number of Comments (Facebook) [#FBCOMMENTS]:____

15. Total number of Shares (Facebook) or Retweets (Twitter) [#SHARES/RETWEETS]:____

NOTES:

Appendix E: Content Coding and Intercoder Reliability

For the web site and social media content analysis, intercoder reliability scores were calculated for the variables with an interpretive dimension that were used in the analysis. Thus, in this case the three variables of concern were whether the story/post was Original, whether it was About the Community, and whether it Addressed a Critical Information Need. In order to be more, rather than less, inclusive, stories/posts that were coded as Unclear for the Original and About Community variables were recoded as Yeses for these categories; thus the Yes and Unclear coding categories were collapsed for the purposes of calculating intercoder reliability. Similarly, because the analyses below utilize the Critical Information Needs variable in a binary capacity (i.e., Yes or No), the eight critical information needs categories also were collapsed into a single Yes category for the purposes of calculating intercoder reliability.

For the social media analyses, the average pairwise agreement across the three coders was 81 percent for the Critical Information Needs and About Community variables; and 100 percent for the Originality variable. For the web site analyses, the average pairwise agreement across the three coders was 79 percent for Critical Information Needs, 89 percent for About Community, and 81 percent for Originality. According to Neuendorf (2002), agreement levels of 80 percent or greater are generally acceptable, with levels in the 70 percent range appropriate for exploratory studies of new indices (as is the case here).

Appendix F: Data Analysis Tables

The tables below present the following information for the aggregate web and social media journalistic output in each of the three communities, broken down according to each individual coding category and combination of coding category: 1) # of stories/posts; 2) stories/posts per 10,000 capita; 4) percentage of stories meeting the coding category(ies); 3) output concentration (expressed as an HHI).

Overall Journalism Activity

Town	Web			Social		
	Stories	Stories/10k	Concentration	Posts	Posts/10k	Concentration
Newark	235	8.48	1902.58	474	17.11	3724
New Brunswick	435	79.09	4559.18	560	101.81	2687
Morristown	358	198.89	2062.20	617	342.78	2576

Original Journalism Activity

Town	Web				Social			
	Stories	Stories/10k	% Original	Concentration	Posts	Posts/10k	% Original	Concentration
Newark	134	4.84	57.02	1530.40	428	15.45	90.3	3763.87
New Brunswick	304	55.27	69.89	4671.10	496	90.18	88.57	3027.28
Morristown	241	133.89	67.32	2335.20	588	326.67	95.30	2605.91

Journalism Activity About Community (A.C.)

Town	Web				Social			
	Stories	Stories/10k	% A.C.	Concentration	Posts	Posts/10k	% A.C.	Concentration
Newark	49	1.77	20.85	1595.17	64	2.31	13.50	1492.74
New Brunswick	106	19.27	24.37	2668.21	117	32.18	31.61	2276.80
Morristown	143	79.44	39.94	1440.11	268	148.89	43.44	2072.57

Original Journalism Activity About Community (O.A.C.)

Town	Web				Social			
	Stories	Stories/10k	% O.A.C.	Concentration	Posts	Posts/10k	% O.A.C.	Concentration
Newark	45	1.62	19.15	1693.83	59	2.13	12.45	1503.42
New Brunswick	99	18.00	22.76	2708.91	151	27.45	26.96	2346.83
Morristown	112	62.22	31.28	1400.24	256	142.22	41.49	2071.84

Journalism Activity Addressing Critical Information Needs (C.I.N.)

Town	Web				Social			
	Stories	Stories/10k	% C.I.N.	Concentration	Posts	Posts/10k	% C.I.N.	Concentration
Newark	102	3.68	43.40	1559.02	186	6.71	39.24	1722.16
New Brunswick	243	44.18	55.86	2993.28	330	60.00	58.93	2973.37
Morristown	198	110.00	55.31	1698.81	395	219.44	64.02	2265.28

Original Journalism Activity Addressing Critical Information Needs (C.I.N.O)

Town	Web				Social			
	Stories	Stories/10k	% C.I.N.O.	Concentration	Posts	Posts/10k	% C.I.N.O.	Concentration
Newark	65	2.35	27.66	1950.30	171	6.17	36.08	1797.13
New Brunswick	184	33.45	42.30	2889.89	284	51.64	50.71	3479.70
Morristown	147	81.67	41.06	2019.99	379	210.56	61.43	2298.72

Journalism Activity Addressing Critical Information Needs About Community (C.I.N.A.C)

Town	Web				Social			
	Stories	Stories/10k	% C.I.N.A.C.	Concentration	Posts	Posts/10k	% C.I.N.A.C.	Concentration
Newark	26	.94	11.06	1360.95	59	2.13	12.45	1611.61
New Brunswick	71	12.91	16.32	1731.80	122	22.18	21.79	2300.55
Morristown	117	65.00	32.68	1432.54	219	121.67	35.49	2056.45

Original Journalism Activity Addressing Critical Information Needs About Community (O.C.I.N.A.C)

Town	Web				Social			
	Stories	Stories/10k	% O.C.I.N.A.C.	Concentration	Posts	Posts/10k	% O.C.I.N.A.C.	Concentration
Newark	22	.79	9.36	1322.31	54	1.95	11.39	1619.87
New Brunswick	65	11.82	14.94	1772.78	105	19.09	18.75	2273.47
Morristown	90	50.00	25.14	1602.47	211	117.22	34.20	2068.91

Endnotes

[1] This source list was generated in the Fall of 2014 and may not reflect new sources of journalism that have since emerged in each of these three communities.

[2] Using website home pages as representative content builds on the tradition of sampling a newspaper's front page, which is the most likely page to be seen by readers, and also represents the news outlet's judgment as to the most important news to the community (e.g. Benson, 2013).

[3] Here, a limited "constructed week" sampling approach was employed. Specifically, seven days of the week (Monday through Sunday) were randomly selected for the month of January, 2015. The specific days selected for analysis were January 2nd, 8th, 11th, 14th, 17th, 20th, and 26th. Inconsistencies in the archiving of older social media posts by the two major social media platforms prevented producing a constructed week from the entirety of a calendar year.

[4] The sampled week of home pages was drawn from February 9th through February 15th of 2015. While it is generally preferable to utilize a "constructed week" sample in content analysis (in which individual days of the week are randomly sampled from across an entire year; see above), the combination of time sensitivity associated with this analysis and the unavailability of systematic archives of the relevant home pages over such a time period prevented such an analytical approach from being employed here. Future iterations or expansions of this research should certainly seek to employ a more rigorous approach to content sampling if time and resources permit.

[5] The HHI involves summing the squared shares of each firm in a market to produce a measure of concentration. It is expressed as follows: $H = \sum_{i=1}^{N} s_i^2$. In the case of this analysis, shares of total journalism output within a community (whether in terms of news stories on the web or social media posts) are used in place of market shares.

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[6] It is important to note that there are a number of radio stations licensed to the city of Newark, but many of these stations' studios and transmission towers are based in New York City, and the stations essentially operate as New York City-focused radio stations. These stations (e.g., WQXR, WNSH, WHTZ) were not included in this analysis as local journalism sources for Newark.