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The Public Purpose is a peer-reviewed interdisciplinary journal presenting the work of American University graduate students from the Departments of Government; Justice, Law, and Criminology; and Public Administration and Policy. Founded in 2003, The Public Purpose is supported by the SPA Graduate Council with involvement and guidance of Faculty Review Board, consisting of some of American University's most distinguished professors. In addition to an annual print journal, The Public Purpose also manages a public policy blog (thepublicpurpose.com). The journal is entirely student run and currently has a staff of about 20 students.

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FROM THE EDITORS

Dear Readers,

We are happy to present The Public Purpose Journal Volume XIV.

In these pages, you will encounter six papers that address several of the most pressing policy issues of our day:

The migration crisis in the European Union
The opioid crisis in Massachusetts
Microfinance in the developing world
Domestic drone policy
Family caregiver policy
Charter schools in the United States

The Public Purpose is an academic journal led by graduate students in American University's School of Public Affairs. We strive to publish a journal that contributes to the literature of our disciplines. These papers reflect the outstanding work of SPA students and faculty on the topics of public policy, public administration, government, justice, law, criminology and terrorism studies.

As a student run organization, the Public Purpose is grateful to the Graduate Student Council and the Dean's office for their personal and financial support. We could not do what we love without your belief in our organization. Thank you!

We hope you enjoy the 2016 Print Edition of the Public Purpose Journal. We encourage you discover our ongoing online work at our website, www.thepublicpurpose.com.

Sincerely,



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MIGRATION AND THE EU: A FAILURE TO PROTECT

by Elizabeth Bersin

ABSTRACT

The European Union (EU) is currently experiencing a mass influx of migrants like never before, constituting the largest movement Europe has experienced since 1945. Most of these migrants are seeking refuge from the Syrian civil war, which has displaced over 8 million people over the past four years. This mass influx has put tremendous pressure on the EU's ability to accept refugee and asylum seekers. This paper examines this failure of the EU, first explaining the history of the EU project and its previous migration policies. Country case studies are also presented to give examples of country dynamics during this crisis. The paper also discusses how the EU can better prepare itself for future such challenges – namely, by creating a coordinated, long-term plan that is adopted by all member states and supported by the various Directorates-General of the EU. Proposed solutions include a joint committee that brings together all relevant Directorates-General and a five-point plan that works as a guide for the most important issues this committee should tackle. This issue cannot be solved by one country alone or even by a small group. It is a global crisis that must be addressed before it spreads even further.

INTRODUCTION

The European Union (EU) is currently experiencing a mass influx of migrants¹ like never before, constituting the largest movement Europe has experienced since 1945². This influx of mostly illegal border-crossings³ began in 2011 with the onset of the Arab Spring, particularly from Tunisia. 2011-2012 saw a surge of migrants from Sub-Saharan Africa seeking refugee from the civil unrest in Libya post-Qaddafi. This most recent surge is composed mostly of Syrian, Eritrean, and Afghan migrants fleeing a growing civil war attempting to use maritime borders to enter the EU⁴ ⁵. Specifically, the Syrian civil war has been a main source of the influx of people. Over four years, more than 8 million people have been displaced due to the conflict and are increasingly fleeing to European countries rather than neighboring countries, which are also now being affected by this war⁶. Currently, over 4.1 million Syrian refugees are still residing in neighboring countries, with Lebanon hosting 1.1 million people, 70% of whom are living below the national poverty line⁷. Jordan is host to over 628,000 refugees, 86% of whom are living below the national poverty line, and Turkey has registered over 2 million people⁸ ⁹. The number of sea arrivals in Europe has exceeded 615,000, 53% of whom are Syrian. The increasing number traveling to Europe is attributed to “the loss of hope that a political solution will soon be found to end the war, as well as to steadily deteriorating living conditions in exile, triggered by

1 Note that the term “migrant” can be used as an umbrella term for refugees, asylum seekers, and economic migrants (Park, 2015).

2 “What Is The Europe Migrant Crisis And How Has It Evolved?” Financial Times, accessed October 9, 2015, <http://www.ft.com/intl/cms/s/2/cdd88362-524e-11e5-b029-b9d50a74fd14.html#axzz3o56W6hcx>.

3 A figure depicting migrants detected entering the EU illegally between January and July 2015 is available in the Appendix, Figure 1.

4 Figure 2 in the Appendix depicts the origins of asylum applications.

5 Jeanne Park, “Europe’s Migration Crisis,” Council On Foreign Relations, updated September 23, 2015, accessed October 9, 2015

6 “What Is The Europe Migrant Crisis”

7 USD 3.84 per person, per day

8 A figure depicting number of Syrian refugees in neighboring countries is available in the Appendix, Figure 3.

9 “Syrian Refugees: Inter-Agency Regional Update,” United Nations High Commissioner for Refugees, accessed October 20, 2015, <http://data.unhcr.org/syrianrefugees/regional.php>

the humanitarian funding shortfall, felt by refugees in the region”¹⁰. This continuing influx of people into Europe “has exposed a long-simmering east-west divide in Europe and called into question the EU’s open-border arrangements”¹¹. The varying methods by which the twenty-eight member states process asylum applications has exacerbated the gray area where economic migrants¹² and asylum seekers¹³ travel together and/or overlap¹⁴. This paper will examine this failure on behalf of the EU to handle the mass influx of migrants, first explaining the history of the EU project and its previous migration policies. This will lead to a discussion about how the EU can better prepare itself for future such challenges – namely, by creating a coordinated, long-term plan that is adopted by all member states and supported by the various Directorates-General of the EU. My proposed solutions include a joint committee that brings together all relevant Directorates-General and a five-point plan that works as a guide for the most important issues this committee should tackle.

THE EU PROJECT

The European Union was created in the wake of the end of World War II with the goal of fostering economic cooperation as a way to avoid future conflict. It was officially created in 1958 as the European Economic Community (EEC), starting with just six countries. This number rose to nine in 1973, and ten in 1981. In 1993, the EEC became the European Union to reflect its evolving and expanding goals¹⁵.

All EU actions are based on binding treaties signed voluntarily by member countries that work towards accomplishing the EU’s goals. Promoting human rights both within the EU and around the world is one of the EU’s main goals; EU governments and institutions are legally bound

10 “Syrian Refugees”

11 “What Is The Europe Migrant Crisis”

12 In this case I will be using the Council on Foreign Relations’ (CFR) definition of economic migrant: a “person whose primary motivation for leaving his or her home country is economic gain” (Park, 2015).

13 As defined by CFR: “a person fleeing persecution or conflict, and therefore seeking international protection under the 1951 Refugee Convention on the Status of Refugees; a refugee is an asylum seeker whose claim has been approved” (Park, 2015).

14 Park, “Europe’s Migration Crisis”

15 “The EU in Brief,” European Union, accessed October 15, 2015, http://europa.eu/about-eu/basic-information/about/index_en.htm

to uphold these rights as set forth in the Lisbon Treaty and the Charter of Fundamental Rights¹⁶. After further expansions in 1995, 2004, and 2007, the total number of EU member states was brought up to 28¹⁷.

THE MIGRATION CRISIS: WHAT POLICIES WERE IN PLACE BEFORE?

While the EU has many treaties and laws in place regarding human rights, it also has regulations directed specifically at migration policy. In 1990, the Dublin system¹⁸ was introduced to help establish responsibility of Member States for examining asylum claim in Europe. Asylum seekers who have family members that have been recognized as having refugee status will have their application examined by the Member State where the family resides. There are a number of regulations and steps in place for asylum seekers who hold a residence permit or visa. These regulations also clarify which Member State is responsible for processing the application. When asylum seekers enter irregularly, whether by land, air or sea, and do not fall under the previously mentioned categories, the Member State whose border they first cross is the one responsible for processing the asylum application^{19 20}. While there are additional provisions included for specific requests by asylum seekers, the Convention's goal is present a clear and simple formula for Member States to determine their responsibility in examining asylum applications. The Dublin Regulation was recast in 2013 to increase efficiency, better standards of protection, and mechanisms for preparedness, crisis management, and early warning²¹.

16 The Charter contains 54 articles grouped under 7 categories: dignity, freedoms, equality, solidarity, citizens' rights, justice, and general provisions ("Charter of Fundamental Rights", 2014).

17 "The EU in Brief"

18 The full title of the convention is the Convention determining the State responsible for examining applications for asylum lodged in one of the Member States of the European Communities.

19 This includes Norway, Iceland, Liechtenstein, and Switzerland in addition to the 28 Member States (Dublin Regulation, 2015).

20 "Convention determining the State responsible for examining applications for asylum lodged in one of the Member States of the European Communities – Dublin Convention," Official Journal of the European Communities C 254, (1990) P. 0001 – 0012, Retrieved from [http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:41997A0819\(01\)](http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:41997A0819(01)).

21 "Dublin Regulation," European Council on Refugees and Exiles, accessed October 7, 2015, <http://www.ecre.org/topics/areas-of-work/protection-in-europe/10-dublin-regulation.html>.

In 1999, the EU began work to improve the legislative framework that was in place by creating the Common European Asylum System (CEAS). The first phase, from 1999-2005, included the adoption of several measures that would set common minimum standards across the EU²². This included a mechanism specifically to deal with a mass influx of people, introduced in July 2001. The Temporary Protection Directive²³ “aims to harmonise temporary protection for displaced persons in cases of mass influx on the basis of solidarity between Member States”²⁴. While this temporary protection mechanism has not yet been used, it is intended for emergency situations in which individual status’ cannot be determined (and is not practical) due to the large number of people arriving. Benefits for asylum seekers include: a residence permit, accommodations, education for minors, and the chance to be reunited with family²⁵.

December 2005 saw the introduction of the EU Asylum Procedures Directive, which establishes procedures for Member States to follow when granting and revoking refugee status. These rules are meant to introduce a framework and prevent the secondary movement of applicants from their original application State to another²⁶. A new version of the Directive became applicable on July 21, 2015 with more specific standards such as: clearer application rules, improved procedures and trainings for decision-makers, support for those who need more help²⁷, appeals, and abuse of the system, such as repetitive claims²⁸. This revision, along with revisions of the many other regulations and directives²⁹, came about as a

22 Common European Asylum System,” European Commission, accessed October 16, 2015, http://ec.europa.eu/dgs/home-affairs/what-we-do/policies/asylum/index_en.htm

23 This is one of five legal documents that make up the EU asylum body of law.

24 “Temporary Protection,” European Council on Refugees and Exiles, accessed October 7, 2015, <http://www.ecre.org/topics/areas-of-work/protection-in-europe/81-temporary-protection.html>

25 “Temporary Protection”

26 “Council Directive on minimum standards on procedures in Member States for granting and withdrawing refugee status,” Official Journal of the European Communities L 326/14 (2005): P. 0013 – 0034, Retrieved from <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2005:326:0013:0034:EN:PDF>

27 Specifically, due to age, sexual orientation, disability, illness, or trauma.

28 “Asylum Procedures,” European Commission, accessed October 16, 2015, http://ec.europa.eu/dgs/home-affairs/what-we-do/policies/asylum/common-procedures/index_en.htm

29 Revised documents include: Asylum Procedures Directive, Reception

result of the European Commission's Policy Plan on Asylum, which was presented in June 2008. This policy plan sets out objectives for CEAS that include: "ensure access for those in need of protection... provide for a single common procedure... establish uniform statuses... incorporate gender considerations... and vulnerable groups... increase practical cooperation... determine responsibility and support solidarity... [and] ensure coherence with other policies"³⁰.

THE MIGRATION CRISIS: HOW HAS THE EU FAILED?

Though the EU has implemented all of these regulations and directives, the theory has not kept up with reality. This system has disproportionately placed the burden of responsibility on states with exposed borders (i.e. entry-point states), many of who are incapable of handling the mass influx of migrants due to an already weak infrastructure or failing economy³¹. Due to these failings, these countries have ceased to enforce important regulations like Dublin and are allowing migrants to travel to secondary destinations rather than processing the applications themselves^{32 33}. While many may want to blame this on the mass influx, the EU struggled to meet self-set goals even before the migration crisis began, as many of the minimum standards left space for too much flexibility and maneuverability by Member States³⁴. This includes allowing Member States to make decisions such as where asylum applicants will reside and allowing Member States to send applicants to a third country³⁵ if there is no risk of

Conditions Directive, Qualification Directive, Dublin Regulation, and EURODAC Regulation

30 "Policy Plan on Asylum: An Integrated Approach to Protection Across the EU", Official Journal of the European Communities" COM360 (2008), Retrieved October 16, 2015, from <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2008:0360:FIN:EN:PDF>

31 In particular, Greece, Italy, and Hungary have struggled with this. A figure depicting the migrants other States are being asked to take from Italy and Greece is available in the Appendix, Figure 3.

32 Figure 4 in the Appendix depicts asylum claims by location. Note that most are not in border states.

33 Park, "Europe's Migration Crisis"

34 Florian Trauner, "Migration Policy: An Ambiguous EU Role In Specifying And Spreading International Refugee Protection Norms," in *EU Policies In A Global Perspective*, ed. Gerda Falkner and Patrick Müller, (New York: Routledge, 2013), 149-166

35 The countries outside the EU deemed safe also varies by state – there is no EU wide list that all countries follow.

refoulement.³⁶ While this requirement may seem specific, refoulement can allow States to move more people than was probably intended by the allowance³⁷. These goals included the development of common minimum standards (seen as phase one), particularly for how states received asylum seekers as well as qualifications for asylum seekers. A second phase was set to evaluate the directives passed and develop a Common European Asylum System to help create uniform procedures and a uniform asylum status³⁸.

While this seems, theoretically, like a feasible plan, common EU Asylum laws have not been received well by all member states and even then still allow Member States choice in how many asylum seekers they are willing to accept, where they come from, and allow States to pass many of them on to other States by skillfully maneuvering through the Dublin system's responsibility rules. As stated earlier, the Directive establishing common procedures states that Member States have to right to send applicants to what the EU considers a safe third country³⁹, as long as the conditions laid out are followed. The recast Dublin Regulation refers to this part of the directive, giving enough ambiguity for countries such as Greece and Hungary a chance to pass on migrants to "safer" countries than their own. The Dublin Regulation also stipulates that while the entry point countries are responsible for examining applications for protection in cases of irregular crossings, this responsibility ceases after 12 months⁴⁰. It is not clear what will happen after these 12 months. While the regulation does

36 The principle of non-refoulement states that "a refugee should not be expelled or returned if his or her life or freedom is threatened" (Trauner, 2013). This was established with the 1951 UN Convention relating to the Status of Refugees.

37 "Directive 2013/32/EU of the European Parliament and of the Council of 26 June 2013 on common procedures for granting and withdrawing international protection," Official Journal of the European Communities L 180/60 (2013), from <http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32013L0032>

38 Trauner, "Migration Policy", 149-166

39 Essentially, all Member States that respect the principle of non-refoulement (Regulation (EU) No 604/2013, 2013).

40 "Regulation (EU) No 604/2013 of the European Parliament and of the Council of 26 June 2013 establishing the criteria and mechanisms for determining the Member State responsible for examining an application for international protection lodged in one of the Member States by a third-country national or a stateless person," Official Journal of the European Communities L 180/31 (2013), <http://eur-lex.europa.eu/legal-content/EN/ALL/;jsessionid=jHNlTp3HLjqw-8mqGbQSpZh1VWpjCyVQq14Hgcztw4pbfSQZffnrn!557467765?uri=CELEX-:32013R0604>

allow for applicants to appeal transfer decisions, the guidelines include the use of “within a reasonable period of time” - reasonable time not being explicitly defined. These guidelines also allow States to deny free legal aid if the appeal is deemed to have “no tangible prospect of success”⁴¹. These ambiguous statements could give States enough maneuverability to use the Dublin as they see fit in an attempt to safeguard their country.

For countries currently experiencing major economic crisis, such as Greece, the budgets for migration issues have not been enough to keep up with the ever-increasing needs. While the European Commission approved an emergency aid package in August that earmarked 473 million euros for Greece and 560 million euros for Italy specifically to help deal with the influx of migrants, it does not seem that this will be enough to help these two struggling countries⁴². This uneven monetary power means that those migrants entering through these borders will not receive the same welcome they may have four years ago. The EU, through its many human rights declarations, consistently states the need to accept asylum seekers fleeing from serious harm or persecution in their home country. Asylum is a fundamental right that Member States are obligated to grant under the Geneva Convention on the protection of refugees, recognized in 1951⁴³. The CEAS has also made clear that “Asylum must not be a lottery. EU Member States have a shared responsibility to welcome asylum seekers in a dignified manner, ensuring they are treated fairly and that their case is examined to uniform standards so that, no matter where an applicant applies, the outcome will be similar”⁴⁴. This however, is not at all what migrants are experiencing, as showcased by the following country-specific examples.

Germany: While Germany has accepted the most migrants out of any EU Member State, there have been many attacks made against migrants across the country. In August, a house that had been converted

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- 41 “Regulation (EU) No 604/2013
 - 42 Park, “Europe’s Migration Crisis”
 - 43 “Common European Asylum System”
 - 44 “Common European Asylum System”

into a shelter for asylum seekers was set on fire. Another attack was made in September on a sports hall that was planning to be used to house migrants. These are just two examples of the more than 200 attacks in the country directed against migrants, evidence of unfair and undignified treatment⁴⁵. It is, however, worth noting that the German government has been particularly willing to receive migrants – the most out of any Member State, in fact⁴⁶. In August, the Government even suspended the Dublin regulation for Syrians, making it easier for them to stay in Germany (not their point of entry), and relieving some of the pressure that has been put on Greece and Italy⁴⁷.

Hungary: Hungary has arguably the worst and most xenophobic policies of the Member States. In an effort to cut off what has become the most accessible route, crossing the Serbian border, Hungary has built a large fence along this border. Victor Orban, the Prime Minister of Hungary, has himself stated, “The problem is not a European problem, the problem is a German problem. Nobody would like to stay in Hungary”⁴⁸. While Orban has conducted in April 2015 “found that 46 percent of polled Hungarians believed that no asylum seeker should be allowed to enter Hungary at all”⁴⁹. Over the summer, the government also ran an anti-immigration campaign by placing billboards all over the country with messages such as “If you come to Hungary, don’t take the jobs of Hungarians”⁵⁰. In early October, Hungary began to expand the fence built along its border with Serbia to follow its border with Croatia as well. The fence was completed October 16 and the border has since been closed⁵¹.

Austria: Over the summer, an abandoned truck near Vienna

45 “Which Countries Are Under The Most Strain

46 Previously referenced figures found in the Appendix provide numbers.

47 Jena McGregor, “On Refugee Crisis, Germany’s Angela Merkel Has Found A Bold Voice”, The Washington Post, September 11, 2015, accessed October 20, 2015, <https://www.washingtonpost.com/news/on-leadership/wp/2015/09/11/on-refugee-crisis-germanys-angela-merkel-has-found-a-bold-voice/>

48 “Which Countries Are Under The Most Strain

49 Park, “Europe’s Migration Crisis”

50 Nick Thorpe, “Hungary’s Poster War On Immigration”. BBC News, June 14, 2014, accessed October 16, 2015, <http://www.bbc.com/news/world-europe-33091597>

51 Margit Feher, “Hungary Completes Croatia Border Fence To Keep Migrants Out,” Wall Street Journal, October 15, 2015, accessed October 21, 2015, <http://www.wsj.com/articles/hungary-completes-croatia-border-fence-to-keep-migrants-out-1444927774>

was found to have the bodies of 71 people, all of whom were migrants attempting to reach secondary destinations (particularly Germany)⁵². While Austria has a mixed history with migrants, both accepting many and recently electing more members of the right-wing, anti-immigration FDP, this event reveals the terrible treatment and exploitation many migrants go through in attempting to reach secondary destinations.

Greece: Greece has struggled the most with the mass influx of migrants who are entering during to its own economic crisis. Many migrants land in Greece as they cross maritime borders to reach the EU, an extremely dangerous route that has already killed many as they attempt to cross the Mediterranean Sea⁵³. Unlike other countries that have been resistant to help migrants entering their states, Greeks and tourists alike have scrambled to give what assistance they can to those who arrive, including food, water, and dry clothing⁵⁴. This, however, is not something Greece will be able to sustain for long.

Italy: Italy, another country dealing with a larger influx of migrants over its borders, has also seen major resistance from residents. Violent clashes resulting from residents protesting the “invasion” of foreigners in Rome in September forced an evacuation of migrants from reception centers. Government officials have also made statements about not having the resources or money to house these migrants⁵⁵. Under the Bossi-Fini law, a controversial immigration law that requires migrants to have work contracts before arriving, many migrants are facing fines or deportation⁵⁶.

As an institution of global governance, the non-cooperation from member states towards a common strategy is a significant failure of the EU as an International Organization. This stems not just from some of the ambiguity of the directives’ language, but also from the lack of adherence by Member States. While many think that the compulsory nature of the directives will garner compliance, this does not seem to be the case so far. Institutional norms, such as the principle of non-refoulement, have not been followed as this crisis has progressed. The willingness of states to subscribe to these international norms, many of which are legally binding, has limited the influence to which the EU as a whole can have⁵⁷.

52 “Which Countries Are Under The Most Strain

53 These deaths are not limited to those attempting to enter through Greece, a graphic depicting deaths by route is available in the Appendix, Figure 5.

54 “Which Countries Are Under The Most Strain

55 “Which Countries Are Under The Most Strain

56 Park, “Europe’s Migration Crisis”

57 Trauner, “Migration Policy”, 149-166

Though it is tempting to place all the blame on the EU as an International Organization, part of the problem is also a failure of member nation-states to fully commit to the organization. As an organization that requires an intense application process, States may feel that once they are accepted, they do not need to make as much effort (especially since, to date, no State has been forcibly removed from the EU).

HOW CAN THE EU BETTER PREPARE FOR FUTURE CHALLENGES?

Given that this crisis has been on a downward spiral since Spring 2015, the EU must make many changes to current policies to regain control and increase stability. In order for these changes to be effective, the EU will need to secure full buy-in from Member States. Legitimacy is key for the EU to be able to enforce the many regulations and directives it has passed in regards to asylum seekers. The issue of legitimacy and non-compliance to norms partially stems from the accession conditions for EU candidate countries. While candidate states are required to comply with the 1951 Convention and 1967 Protocol, they are only encouraged to harmonize in-country asylum legislation and to strengthen existing systems⁵⁸. Without a requirement to adhere to the EU Asylum Acquis, recent entrants, specifically Eastern European countries such as Hungary, will find no reason to spend the money on revamping what was most likely a very weak system before accession. While this would be difficult to make retroactive, the EU could implement a fine system for non-compliance of Directives, using the money to fund programs for asylum seekers. If States still do not comply, it may be necessary to put them on “probation”, with a threat of removal from the EU as punishment for extended non-compliance. Much of this difficulty though, relates back to the issue of state sovereignty – European states regard migration control as a central part of their national sovereignty, and subscribing to an EU-wide policy would take away that right to sovereignty. Non-cooperation has also been rampant among the various Directorates-General of the EU; something that needs to change before Member States can even be approached about revamping the EU migration system⁵⁹.

While the EU Commission issued a ten-point plan in April, it came about through cooperation only between Home Affairs and Foreign Affairs. This plan includes items such as a “capture and destroy” plan of

58 Trauner, “Migration Policy”, 149-166

59 Stephen Castles ““Why Migration Policies Fail”, *Ethnic And Racial Studies* 27 (2) (2004): 205-227, doi:10.1080/0141987042000177306.

attack for smuggler vessels, which could pose a major danger to migrants, and continues to rely on Member States to voluntarily relocate migrants⁶⁰
⁶¹. While this plan may stop these vessels, it will not stop the flow of migrants. As long as people are willing to pay, smugglers will continue to bring migrants to the EU, choosing more dangerous routes. The situation migrants are facing at home and in neighboring countries is dire enough that they are willing to risk their lives to make the journey, no matter what.

The Directorate-General (DG) for Migration and Home Affairs should be leading the effort but work very closely and in coordination with the DGs for Humanitarian Aid and Civil Protection, Maritime and Fisheries Affairs, and Economic and Financial Affairs. All these departments have a large stake in the outcome of this crisis and each office deals with a crucial piece of the puzzle. The formation of a group to examine the crisis and create a plan of action should also include a representative from FRONTEX, the EU border control agency. The credibility of this body will much depend on leaders of the Member States, which I will touch on after outlining the responsibilities of the group. This group's tasks should include:

1. Review the inflow of migrants, including where they are coming from, how many come from certain countries, the rate at which they are arriving, and how they are arriving. The European Commission has proposed a permanent solidarity mechanism that would be triggered based on an increase in asylum applications over a period of six months, an increase in irregular border crossings over a period of six months, and the number of asylum applications per capita, as compared to the average⁶². This mechanism however, only implements a relocation strategy. The six month waiting period is also too long – six months into a migration crisis will force Member States to play “catch up”, similar to what they have been trying to do now. This process should instead consider an EU-wide “State of Emergency” declaration that would allow for easier suspension of Dublin Regulations under extenuating circumstances and could also be used in the future, were this to happen again. The proposed “State of Emergency”

60 A list of all ten points is available in the Appendix, Figure 7.

61 “Joint Foreign And Home Affairs Council”

62 European Solidarity: A Refugee Relocation System, European Commission, http://ec.europa.eu/dgs/home-affairs/what-we-do/policies/european-agenda-migration/background-information/docs/2_eu_solidarity_a_refugee_relocation_system_en.pdf.

would halt normal border control operations and utilize extra FRONTEX support to assist border states with the increased flow of migrants. It would be declared active if the number of migrants to cross the border were to exceed 50,000 in the span of one week. Temporary housing would be set up near borders and additional processing agents would be sent to the areas handling the border crossings. The Temporary Protection Directive should also be considered.

2. Enter discussions with countries nearer to the crisis zones, such as North Africa, Saudi Arabia and the UAE, Pakistan and India, on whether they would be willing to either accept refugees or set up temporary processing camps for those who would like to go to Europe, as well as how many. The processing camps would be used to process applications in a safe environment before migrants start their journey. To date, the EU does not seem to have approached this idea⁶³, or if they have, it has been on such a small scale that no one has taken notice.
3. Reexamine maritime borders and law, working with other states in an attempt to better control the flow of migrants over these borders to ensure safer passage. This would include temporary processing camps and the use of safe and seaworthy vessels, sponsored by governments or NGOs, to carry those migrants who are accepted as refugees across the Sea.
4. Create a plan of action for the redistribution of migrants. This should be a formulaic strategy based off current economic status and infrastructure to help relieve some of the pressure of nations like Greece and Italy, but also lift pressure for the EU to finance asylum programs in these countries. The EU recently approved a redistribution plan for approximately 200,000 migrants that takes into account each Member State's size of population, total GDP, average number of asylum applications over the last four years, and unemployment rate to determine how many people each country must take⁶⁴ ⁶⁵. Under this plan, receiving Member State

63 The EU has only drafted an Action Plan on Refugee Support with Turkey.

64 Population size and GDP are each worth 40% and increase the number of refugees a country must take. Average number of applications and unemployment are each worth 10% and decrease the number of refugees a country must take (European Solidarity: A Refugee Relocation System).

65 An estimate of the redistribution is available in the Appendix, Figure 8 and 9.

will be compensated €6000 per person received and Member States sending away people (Italy, Greece, and Hungary) will receive €500 to cover relocation costs^{66 67}. While this formula is a good start, it should also take into account available jobs or job opening, as well as the capacity for social services. This will ensure that resettled migrants will have access to the services they need, such as health care, as well as the opportunity to find employment (a low unemployment rate does not always mean there are jobs available).

5. Begin to explore long-term options by examining maximum capacity for accepting migrants, whether refugees will be able to apply for residency permits and eventually citizenship, how they will be integrated into the Member States (jobs, education, health care, etc.), and if the EU will need more support from other countries, such as the US and Canada, in accepting migrants.

In the end, the feasibility of this plan will depend on the willingness of EU member states to take part in a new policy formation that all members would have to subscribe to. The EU would have to create incentives for Member States to subscribe and participate in the process. Part of this could be financial, similar to the benefits included in the relocation scheme. It could include not just funding for receiving migrants, but also include financial incentives such as tax breaks for businesses that hire refugees⁶⁸. Member States should also each have a representative on the committee, as well one or two subject matter experts on their State's economy and/or infrastructure capabilities. This will give members states a voice in the process, giving them more buy-in, and lend expert advice to the decision-making process. Going forward, states looking to join the EU must subscribe to EU migration policies and Asylum Acquis before being accepted – this is the only way to ensure it is actually done.

Other than a policy change, the EU populations need to adjust their norms of actions in response to such a crisis. While the UN and EU Charter and directives may set out norms of behavior, many countries, particularly recent EU accession countries, do not yet subscribe to these

66 Member State from which migrants are relocated will not be part of the relocation scheme. Associated States (Denmark, Ireland, and the UK) can choose whether or not they would like to participate (European Schemes For Relocation And Resettlement).

67 “European Solidarity”

68 This assumes that the visa granted allows refugees to work, which is not always the case. If they do however, this economic advantage may increase willingness to accept migrants, and encourage businesses to vouch for the acceptance of migrants.

norms. Xenophobic attitudes towards migrants – people who often have no choice but to flee their home countries in fear of their lives – will stunt any progress the EU attempts to make if these attitudes do not change. It is important to note that these norms will be slow to shift, particularly in states such as Hungary. Given that fact, it is even more important that the EU promote acceptance of migrants using strategies such as the financial incentives previously mentioned. By covering some of the financial burden of the states, it is more likely that migrants will be accepted rather than pushed away because of the financial strain they may put on Member States. Though providing financial and program assistance may not promote happy acceptance, it may at least allow a sense of indifference towards whether or not states accept refugees, which in itself is an improvement from some of the current feelings of hatred and anger towards migrants, and may slowly lead to happy acceptance, as States receive more and more benefits.

CONCLUSION

As an institute of global governance the EU must present a united front. No one state or non-state actor can accomplish much by themselves. This migration crisis has crossed both land borders and maritime borders, spreading from the Middle East and Africa into the Mediterranean, into Southern Europe and up to the northern most points of the continent. If action is not taken soon, it could spread even further.

APPENDIX

FIGURE 1: ILLEGAL MIGRANT ENTRY, JANUARY-JULY 2015 (MIGRANT CRISIS, 2015)

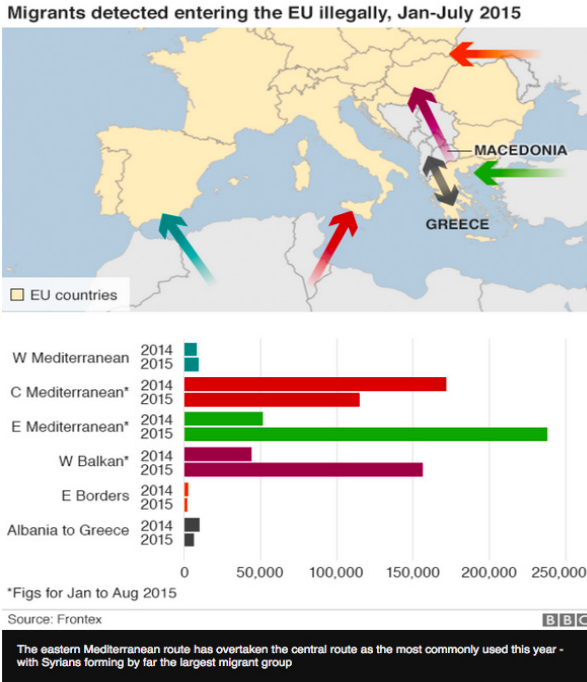


FIGURE 2: TOP 10 ORIGINS OF PEOPLE APPLYING FOR ASYLUM IN THE EU (MIGRANT CRISIS, 2015)

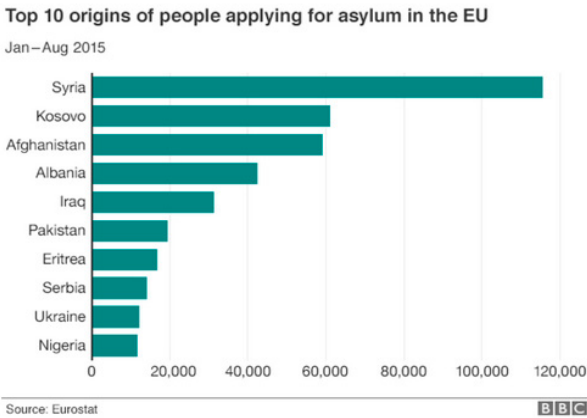


FIGURE 3: REFUGEES AND THOSE AWAITING REGISTRATION IN NEIGHBORING COUNTRIES TO SYRIA (UNCHR, 2015)

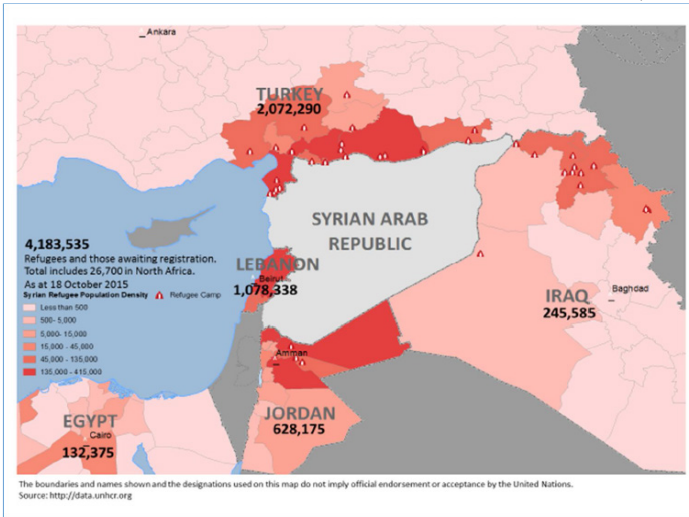
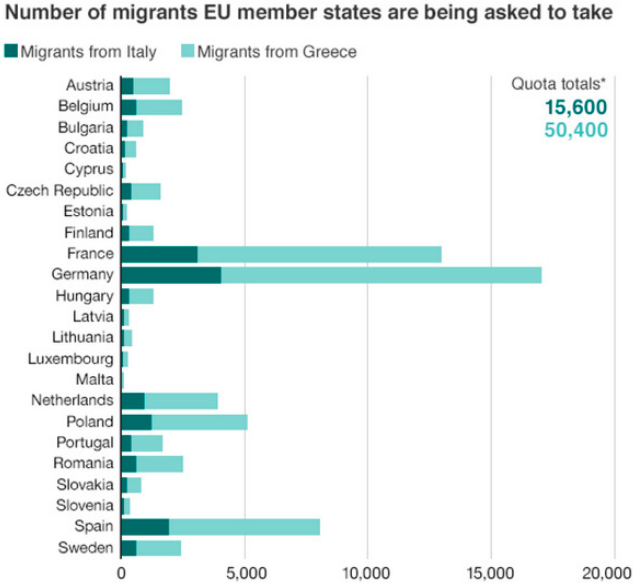


FIGURE 4: NUMBER OF MIGRANTS EU MEMBER STATES ARE BEING ASKED TO TAKE (MIGRANT CRISIS, 2015)



Note: UK has opted out, Ireland has offered to take 4,000, Denmark will take 1,000.
 Switzerland and Norway have also agreed to take refugees, numbers yet to be agreed.
 *Relocation of a further 54,000 migrants still to be decided.

Source: European Commission



FIGURE 5: ASYLUM CLAIMS IN EUROPE, 2015 (MIGRANT CRISIS, 2015)

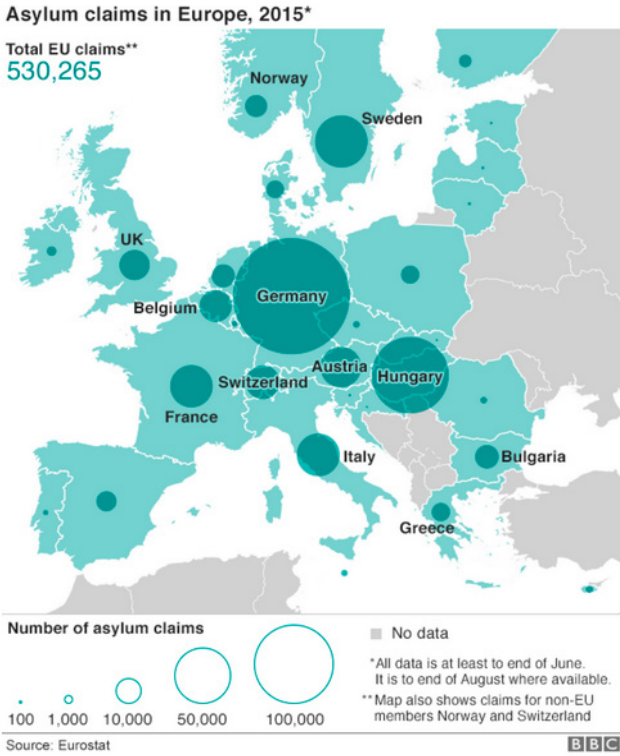


FIGURE 6: MEDITERRANEAN MIGRANT DEATHS BY ROUTE (MIGRANT CRISIS, 2015)

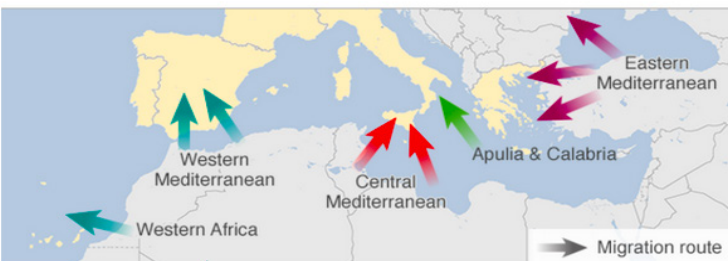


FIGURE 7: EUROPEAN COMMISSION 10-POINT PLAN (EUROPEAN COMMISSION, 2015)

Ten points

- Reinforce the Joint Operations in the Mediterranean, namely Triton and Poseidon, by increasing the financial resources and the number of assets. We will also extend their operational area, allowing us to intervene further, within the mandate of Frontex;
- A systematic effort to capture and destroy vessels used by the smugglers. The positive results obtained with the Atalanta operation should inspire us to similar operations against smugglers in the Mediterranean;
- EUROPOL, FRONTEX, EASO and EUROJUST will meet regularly and work closely to gather information on smugglers modus operandi, to trace their funds and to assist in their investigation;
- EASO to deploy teams in Italy and Greece for joint processing of asylum applications;
- Member States to ensure fingerprinting of all migrants;
- Consider options for an emergency relocation mechanism;
- A EU wide voluntary pilot project on resettlement, offering a number of places to persons in need of protection;
- Establish a new return programme for rapid return of irregular migrants coordinated by Frontex from frontline Member States;
- Engagement with countries surrounding Libya through a joined effort between the Commission and the EEAS; initiatives in Niger have to be stepped up.
- Deploy Immigration Liaison Officers (ILO) in key third countries, to gather intelligence on migratory flows and strengthen the role of the EU Delegations.

FIGURE 8: EUROPEAN RELOCATION SCHEME (EUROPEAN SCHEMES FOR RELOCATION AND RESETTLEMENT)

Member States ^{53 54}	Key
Austria	2,62%
Belgium	2,91%
Bulgaria	1,25%
Croatia	1,73%
Cyprus	0,39%
Czech Republic	2,98%
Estonia	1,76%
Finland	1,72%
France	14,17%
Germany	18,42%
Greece	1,90%
Hungary	1,79%
Italy	11,84%
Latvia	1,21%
Lithuania	1,16%
Luxembourg	0,85%
Malta	0,69%
Netherlands	4,35%
Poland	5,64%
Portugal	3,89%
Romania	3,75%
Slovakia	1,78%
Slovenia	1,15%
Spain	9,10%
Sweden	2,92%

Calculations are based on statistical information provided by Eurostat (consulted on 8 April 2015).

FIGURE 9: EUROPEAN RELATIONS SCHEME, INCLUDING ASSOCIATED STATES (EUROPEAN SCHEMES FOR RELOCATION AND RESETTLEMENT)

Member States ⁵⁵	Key	Total allocation based on 20.000 persons
Austria	2,22%	444
Belgium	2,45%	490
Bulgaria	1,08%	216
Croatia	1,58%	315
Cyprus	0,34%	69
Czech Republic	2,63%	525
<i>Denmark⁵⁵</i>	<i>1,73%</i>	<i>345</i>
Estonia	1,63%	326
Finland	1,46%	293
France	11,87%	2375
Germany	15,43%	3086
Greece	1,61%	323
Hungary	1,53%	307
<i>Ireland⁵⁶</i>	<i>1,36%</i>	<i>272</i>
Italy	9,94%	1989
Latvia	1,10%	220
Lithuania	1,03%	207
Luxembourg	0,74%	147
Malta	0,60%	121
Netherlands	3,66%	732
Poland	4,81%	962
Portugal	3,52%	704
Romania	3,29%	657
Slovakia	1,60%	319
Slovenia	1,03%	207
Spain	7,75%	1549
Sweden	2,46%	491
<i>United Kingdom⁵⁶</i>	<i>11,54%</i>	<i>2309</i>

Calculations are based on statistical information provided by Eurostat (consulted on 8 April 2015).

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THE IMPACT OF NALOXONE ACCESS ON OPIOID OVERDOSES IN MASSACHUSETTS: A SINGLE INTERRUPTED TIME SERIES DESIGN

by Amy Purpura

ABSTRACT

In 2006, Massachusetts implemented the Overdose Education and Naloxone Distribution (OEND) prevention program in order to reduce the fatality associated with opioid overdoses. As part of this program, individuals could receive kits containing naloxone contingent on completing training to administer the drug. This program evaluation uses multivariate regression analysis in order to determine whether or not OEND had an effect on the rate and number of overdoses in Massachusetts counties after implementation. The research design is characterized as an interrupted time series evaluation with comparison groups, using data on Massachusetts counties both before and after OEND was implemented. Multivariate regression indicates that OEND reduced both the rate and number of overdoses in counties once the program had been in place for at least one year. These results are significant at an alpha level of 0.10. According to this study, the rate of overdoses in Massachusetts counties was reduced by 1.12 individuals per 100,000 in the population. This reduction reflects the life-saving properties of naloxone, and its magnitude provides a compelling reason to enact this policy change, given the problem of rising opioid overdoses throughout the United States.

INTRODUCTION

Overdose from opioid drugs (heroin and other prescription medications) has become a serious public health problem in the United States. According to data from the Centers for Disease Control (CDC), the rate of fatal drug overdoses increased by 130 percent from 1999-2013, and most of this increase is due to higher use and abuse of prescription drugs – particularly opioids.¹ In response, some advocacy organizations, policymakers, and other stakeholders have worked to increase access to the drug naloxone hydrochloride (naloxone). This drug acts as an “opioid antagonist” that can “reverse the potentially fatal respiratory depression caused by heroin and other opioids”.² More precisely, if naloxone is given to an individual experiencing an opioid overdose, it has the potential to prevent the overdose from becoming fatal.

States and localities have begun implementing and testing programs that provide naloxone to individuals who are at risk or know individuals who are at risk of opioid overdose. Since these programs give naloxone to non-medical professionals, programs also require those individuals to receive training in how to recognize an opioid overdose and what to do when an individual is experiencing one – including how to administer naloxone and perform rescue breathing.³ This training is essential to ensure that individuals actually know how to use naloxone and what other steps to take that increase the likelihood of survival for the person experiencing the overdose.

In response to rising overdose rates in the state, Massachusetts has implemented a naloxone program through its Department of Public Health in order to reduce the rate of fatal overdoses from opioids, and its program will be the focus of this evaluation. The Overdose Education and Naloxone Distribution (OEND) prevention program started in 2006 in limited locations and was expanded in 2012 to bring training and naloxone

1 Leonard J. Paulozzi et al., “Controlled Substance Prescribing Patterns – Prescription Behavior Surveillance System, Eight States, 2013,” *Morbidity and Mortality Weekly Report Surveillance Summaries* 64, no. 9 (October 16, 2015): 1, <http://www.cdc.gov/mmwr/preview/mmwrhtml/ss6409a1.htm>.

2 Eliza Wheeler et al., “Opioid Overdose Prevention Programs Providing Naloxone to Laypersons — United States, 2014,” *Morbidity and Mortality Weekly Report* 64, no. 23 (June 19, 2015): 631, <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6423a2.htm>.

3 “Opioid Overdose Education and Naloxone Distribution: MDPH Naloxone pilot project Core Competencies,” Massachusetts Department of Public Health, Accessed December 29, 2015, <http://www.mass.gov/eohhs/docs/dph/substance-abuse/core-competencies-for-naloxone-pilot-participants.pdf>.

distribution centers to every county. Text of the law from the Department of Public Health states:

- Naloxone may lawfully be prescribed and dispensed to a person at risk of experiencing an opiate-related overdose or a family member, friend or other person in a position to assist a person at risk of experiencing an opiate-related overdose.⁴

The aim of this program is relatively straightforward: expanding access to naloxone in order to reduce the number of fatal opioid overdoses. Consequently, this evaluation will examine how both the number and the rate of unintentional opioid overdose deaths has been impacted with the implementation of this program.

The research will proceed as follows: Part I will present an overview of previous literature that has examined the impact of naloxone programs. Part II will describe the research design for this evaluation and defend why this is the best design available. Part III will provide an overview of the key variables of interest, including the treatment variable, the outcome variable, and control variables, along with descriptive statistics for the continuous variables. Part IV will present the results of the evaluation and, finally, Part V will present a discussion of their implications.

PART I: LITERATURE REVIEW

The majority of previous research evaluations for programs that expand access to naloxone have focused on obtaining quantitative data on the number of trainings completed by participants, the number of kits administered, and the number of overdoses that were reportedly reversed through naloxone treatment, along with some limited qualitative data. These data were collected through a variety of sources, and their analyses support the efficacy of naloxone programs in reversing potentially fatal opioid overdoses.

Banjo et al. gathered data from the British Columbia Take Home Naloxone program in Canada that was tested at 40 sites across the province.⁵ After the program was implemented for 18 months, 1,318 individuals had been trained to recognize and respond to overdose, and there were 836 kits administered to the participants. From these kits, there were reports of 85 cases in which opioid overdoses were reversed through

4 “Opioid Overdose Education,” 4.

5 Oluwajenyo Banjo, “A quantitative and qualitative evaluation of the British Columbia Take Home Naloxone program,” *CMAJ Open* 2, no. 3 (2014): E153, doi:10.9778/cmajo.20140008.

naloxone.⁶ In addition, qualitative data from interviews with stakeholders found general support for the program, and participants “reported a strong sense of pride for taking part” and “having learned the skills to help save someone’s life.”⁷ The only negative responses came from police who believed that participants would fail to call medical authorities following administration of naloxone due to overconfidence that the user had fully recovered. Police were also concerned about the potential for black market sales of naloxone, although this has so far not been empirically demonstrated.⁸

Evaluations of similar programs in New York City and San Francisco corroborate these findings. Piper et al. collected questionnaires between March 2005 and December 2005 in New York City from 122 participants who requested a naloxone refill.⁹ Of the 71 participants who had witnessed an overdose since their training, participants administered naloxone “82 times (i.e., some participants had used naloxone more than once)”, and this resulted in the reversal of 68 overdoses with the outcome of the remaining 14 cases being unknown.¹⁰ Rowe et al. used data reported by 2,500 registered participants in the San Francisco naloxone distribution program to find that there were 702 overdoses reversed between 2010 and 2013.¹¹ They also used demographic characteristics from this data to run logistic models that identified what types of participants were more likely to obtain naloxone refills and report reversals of overdoses.¹² However, the specific findings from the logistic models are outside the scope of the evaluation conducted in this research, as data was not collected in Massachusetts about characteristics of program participants.

Walley et al. conducted an evaluation that is most relevant to this one, as they analyzed rates of unintentional opioid overdoses in Massachusetts communities.¹³ Their study also takes advantage of an

6 Ibid.

7 Ibid., E158.

8 Banjo et al., E158

9 Tinka Markham Piper et al., “Evaluation of a Naloxone Distribution and Administration Program in New York City,” *Substance Use & Misuse* 43, no. 7 (2008): 858, doi: 10.1080/10826080701801261.

10 Ibid., 862.

11 Christopher Rowe et al., “Predictors of participant engagement and naloxone utilization in a community-based naloxone distribution program,” *Addiction* 110, no. 8 (August 2015): 1301, doi:10.1111/add.12961.

12 Ibid., 1301.

13 Alexander Y. Walley et al., “Opioid overdose rates and implementation of overdose education and nasal naloxone distribution in Massachusetts: interrupted time series

interrupted time series design by looking at these rates from 2002-09 with the program interruption occurring in 2006-07 when certain communities instituted OEND programs.¹⁴ The authors bifurcated the program variable based on the number of participants enrolled in the program for each community such that high enrollment was defined as a community with more than 100 people enrolled per 100,000 in the population and low enrollment meant there were fewer than 100 participants per 100,000 residents.¹⁵ Their results show that, compared to communities with no naloxone distribution programs, communities with low enrollment experienced about 27 percent lower rates of fatal opioid overdoses and communities with high enrollment had rates that were 46 percent lower (Walley et al., 2013).¹⁶

PART II: RESEARCH DESIGN AND METHODOLOGY

This study is characterized as an interrupted time series evaluation with comparison groups (ITSCG), and the unit of analysis is a county-year. This evaluation concentrates on the OEND prevention program in Massachusetts because their Department of Public Health has the best data available for the annual number of unintentional opioid overdoses in each county from 2000-2014.¹⁷ These types of overdoses are the focus because data is not available on intentional overdoses and because unintentional overdoses tend to happen more often in the presence of others who could prevent fatality with naloxone. In addition, Massachusetts has a large number of naloxone training and distribution centers compared to other states since this program has been in effect for almost a decade, and opening of centers varies by county-year such that certain counties had centers open at the inception of the program in 2006 and other counties had centers opened in later years with the most recent centers opening in 2012. These features of the Massachusetts program and the quality of data available about overdose rates make Massachusetts an excellent location to examine the effect of naloxone programs. No other state had a program instituted long enough to allow enough time for it to have an impact on

analysis,” *BMJ* 346, no. f174 (2013): 1, doi: 10.1136/bmj.f174.

14 Walley et al., 2.

15 *Ibid.*, 3.

16 *Ibid.*, 10.

17 “Data Brief: Fatal Opioid-related Overdoses among Massachusetts Residents.” Massachusetts Department of Public Health. Last modified April 6, 2015. <http://www.mass.gov/eohhs/docs/dph/quality/drugcontrol/county-level-pmp/data-brief-apr-2015-overdose-county.pdf>.

rates of fatal overdoses, or those states did not have publicly available data on the annual rates of fatal overdoses within each county.

Further, in the absence of data from a randomized experiment, an ITSCG design is desirable to evaluate a naloxone access program because this design can isolate the program's impact from other historical trends that could explain the rate of fatal opioid overdoses. For instance, opioid use has increased substantially since 2005, which is indicated by Figure 1 of the appendix where the drug use indicator traces the rate of opioid use over time in Massachusetts. Much of this increase in use can be traced to prescription opioids, including oxycodone and hydrocodone.¹⁸ Consequently, the rate of fatal opioid overdoses in each Massachusetts county has also increased over this same time period; Figure 2 shows where each county-year is represented by a point in the scatterplot. Having these yearly data for each county both before and after the naloxone program was implemented will isolate historical trends that could detract from a possible effect of the OEND program.

Using this design with annual data from each of the 14 counties in Massachusetts, multivariate regression analysis will determine how the OEND program impacted fatal overdoses from opioids. The null and alternative hypothesis to be analyzed with this design are stated below:

Null Hypothesis: OEND programs have no effect on fatal opioid overdoses ($\beta=0$)

Alternative Hypothesis: OEND programs have an effect on fatal opioid overdoses ($\beta\neq 0$)

For this reason, the coefficient associated with program inception found from the multivariate regressions will represent the impact of the program on fatal overdoses, and statistical significance will be evaluated at an alpha level of 0.10. Data on the number of overdoses in each county in Massachusetts was found from 2000-2014 with the exception of 2013-14 data in Nantucket and Dukes counties, so this missing data limits total observations from 210 to 206. Separate regressions will also be performed that entirely exclude Nantucket and Dukes county since data for those years are missing, and the number of overdoses in these counties is abnormally low (0-3 total) compared to other counties. The low number of fatal overdoses in these locations is most likely due to the fact that these areas are tiny islands mostly populated by vacation homes. In addition, data indicating the level of opioid use in each county over time was only

found from 2005-2014, so the regression analysis will be limited to 136 observations when all counties are included or to 120 observations when Nantucket and Dukes are excluded. Although limiting the regression to the data from these county-years will lower the number of available observations, it is important to include the control variable indicating the level of opioid use since it will impact the outcome variable of fatal overdoses, and, thus, its omission will bias the regression results.

In addition, since the multivariate regression analysis will be performed on multiple observations over time from the same 14 counties in Massachusetts, the statistical analysis will use clustered standard errors based on the county. This clustering will control for the fact that observations from the same county over this time period will not be independent from one other because observations within one county will be more similar to each other than observations from another county. For instance, there are certain characteristics of one county that contribute to the fatal opioid overdoses, such as the fact that Boston is a large and diverse city located within Suffolk county, and other Massachusetts counties will be more rural.

PART III: DATA DESCRIPTION

As detailed in Part II, the outcome variable will represent fatal overdoses in Massachusetts since the OEND program was implemented to address this problem. The Massachusetts Dept. of Public Health compiles and publishes yearly data on “the number of unintentional opioid overdose deaths by county”, so this data only counts cases where there is a reasonable basis to determine that the subject did not intend to commit suicide.¹⁹ Since this data only reports the raw number of overdoses, United States Census Bureau (2015) counts of the population in each county from 2000-2014 was used to calculate the rate of unintentional opioid overdoses in each county per 100,000 residents.²⁰ Table 1 in the appendix summarizes key descriptive statistics of these two outcome variables. For instance, the number of overdoses ranges from a minimum of zero to a high of 257 in Middlesex County in 2014. In addition, the mean number of overdoses is about 44, yet the standard deviation is 41, indicating high variance. For this reason, using the rate of overdose deaths per 100,000 residents in a county may provide a better indicator of fatal overdoses since there is less

19 “Data Brief,” 3.

20 U.S. Census Bureau, “State and County QuickFacts,” U.S. Department of Commerce, Last modified December 1, 2015, Accessed December 29, 2015, <http://quickfacts.census.gov/qfd/states/25000.html>.

variation in the rate with a minimum of zero and a maximum of 24.9, and this spread of rates is shown in Figure 2. The average rate of fatal overdoses in a county-year is 8.31 with a standard deviation of about 5.

The OEND program is the treatment being evaluated by this design, so it is represented as a dummy variable equal to one if the county has a naloxone training and distribution center open in that year. The program was started in 2006 with the first centers opening that year in Suffolk, where Boston is located. Centers were opened in Middlesex in 2007. The program expanded further in 2008 to Barnstable, Bristol, Essex, and Hampden counties. Centers opened in the rest of the Massachusetts counties in either 2010 or 2012. Data indicating when centers were opened come from a program overview presented by Dr. Alexander Walley²¹ and the Massachusetts Dept. of Public Health.²² In order to better estimate the impact of the OEND program, a second lagged program variable was coded to indicate whether a county had a naloxone training and distribution center opened in the previous year. This lagged variation will track whether it takes additional time for enough individuals to receive training and naloxone kits in order to have a meaningful impact.

Other important variables that could impact the overall number of fatal opioid overdoses were included in the multivariate regressions if data measuring the variable was publicly available. As previously stated, data were found to indicate the level of opioid abuse in the overall Massachusetts population. When individuals enter rehab in the state, they are asked what drugs they had used in the previous year, and the percentage of people admitting to the use of these drugs is compiled by the Massachusetts Department of Public Health.²³ Figure 1 in the Appendix shows that more clients in rehab programs have been reporting opioid use from a low of about 61 percent in 2005-07 to a high of about 77 percent in 2014, as is also reflected in Table 1.

Another key dummy variable controls for whether or not a county

21 Alexander Y. Walley, "Overdose education and naloxone rescue kits in Massachusetts," Red Project, Last modified May 12, 2014, Accessed December 29, 2015, <http://redproject.org/wp-content/uploads/2014/01/Overdose-Education-and-Naloxone-Distribution-Massachusetts-Part-1.pdf>.

22 "Opioid Overdose Prevention & Reversal: Information Sheet," Massachusetts Department of Public Health, Last modified July 2015, <http://www.mass.gov/eohhs/docs/dph/substance-abuse/naloxone-info.pdf>.

23 "Description of Admissions to BSAS Contracted/Licensed Programs: FY 2014," Massachusetts Department of Public Health, Last modified March 5, 2015, <http://www.mass.gov/eohhs/docs/dph/substance-abuse/care-principles/state-and-city-town-admissions-fy14.pdf>.

is designated as a High Intensity Drug Trafficking Area (HIDTA) by the federal government where a county is coded one if it has such status. Six counties in Massachusetts have this status, and law enforcement agencies located in these counties receive additional funds and resources from the federal government to help target and limit drug trafficking, along with its consequences.²⁴ Thus, HIDTA status likely has an association with opioid overdoses. However, the direction of this effect is undetermined since higher drug trafficking in these counties could lead to more fatal opioid overdoses from the presence of more illegal drugs, or larger resources to target drug trafficking could reduce drug use and consequently fatal overdoses in HIDTA counties.

The population of each Massachusetts county in these years is also included as a control, but there are other features of each county that cannot be measured by the population or controlled through the clustered standard errors by county. As a result, regression analyses include fixed effects in the form of many dummy variables for each county and another set of dummy variables for each year. Certain features of each county and each year may influence overdoses, but not all of these features can be controlled through the inclusion of specific variables. For this reason, fixed effects at the county level or within each year that could have an effect on fatal opioid overdoses can be controlled through this statistical technique.

Part IV: Evaluation Results

Given this available data, regression results will take the following form to estimate program impact where controls include coefficients for other confounding variables and fixed effects:

$$\text{Overdoses}_{it} = \alpha + \beta_1(\text{program}_{it}) + \beta_2(\text{laggedprogram}_{it}) + \text{controls}(z_{it}) + (\text{FEit}) + e_{it}$$

Results from two separate regressions indicate that the OEND program has a negative effect on fatal opioid overdoses in Massachusetts. The first regression includes observations from all Massachusetts counties and the other excludes observations from Nantucket and Dukes County. This negative effect of OEND programs was only observed through the lagged program coefficient, and the non-lagged program coefficient did not achieve statistical significance at an alpha level of 0.10. The program tends to be introduced in areas where overdoses are known to be high, so it is unsurprising that there is no effect seen in the first year. Nevertheless, from these findings, the null hypothesis can be rejected in favor of the

24 “Massachusetts Drug Control Update,” Executive Office of the President of the United States, Accessed December 29, 2015, https://www.whitehouse.gov/sites/default/files/docs/state_profile_-_massachusetts.pdf.

alternative hypothesis since the OEND program has clearly reduced fatal opioid overdoses. Following is a more detailed description of the results from the two separate regressions.

Table 2 includes the coefficients and their associated p-values from a regression conducted on the limited selection of Massachusetts counties where Nantucket and Dukes county are excluded. In this case, the outcome variable is the rate of fatal opioid overdoses per 100,000 residents in a county. The following regression equation was found:

$$\text{Rate}_{it} = 303.98 + 1.2(\text{program}_{it}) - 1.12 (\text{laggedprogram}_{it}) + \text{controls}(z_{it}) + e_{it}$$

From this analysis, the OEND program is estimated to reduce the rate of fatal overdoses by 1.12 per 100,000 county residents once naloxone training and distribution centers have been opened for a year based on the lagged program variable. This coefficient achieved statistical significance at the alpha level of 0.10, so the estimated reduction in the rate of fatal overdoses is precise with at least 90 percent confidence. However, the magnitude of the coefficient only indicates slight practical significance because the programs are only expected to decrease the rate of fatal overdoses by about 22 percent of a standard deviation, which is large in magnitude, given the high monetary value of one statistical life saved in cost-benefit analysis. Without including a lagged program variable for treatment, the OEND program is estimated to actually increase the rate of fatal overdoses in Massachusetts, even though this coefficient does not achieve statistical significance.

Table 3 summarizes the results from the regression using data in all Massachusetts counties where the outcome variable is the number of fatal opioid overdoses, not the rate. The following regression was found from this model:

$$\text{Count}_{it} = -201.07 + 2.49(\text{program}_{it}) - 7.09 (\text{laggedprogram}_{it}) + \text{controls}(z_{it}) + e_{it}$$

In this analysis, the OEND program is estimated to reduce the number of fatal overdoses by about seven in each county once the naloxone centers have been opened for one year as indicated by the lagged treatment variable. Like the preceding model, this lagged program coefficient reached statistical significance at an alpha level of 0.10. Similarly, the magnitude of this estimated coefficient has practical significance since the program is estimated to decrease the number of fatal overdoses by roughly 17 percent of a standard deviation. On average then, counties that have had the naloxone program in place for at least a year will experience roughly seven fewer opioid overdoses amongst all of their residents.

Comparing resulting coefficients from both of these regressions shows important similarities. The key treatment variable looking at the lagged effect of the OEND program is similar in its direction and magnitude in both models. Though the standardized magnitude is slightly smaller in Table 3 when the outcome variable is measured as the number of overdoses, the comparable results from both models certainly indicates that the OEND program is succeeding in its goal of reducing the rate of unintentional opioid overdoses. The high magnitude of the effect observed in both models results from the medical properties of naloxone and the life-saving effects it has when more people have access to it through programs like the one in Massachusetts. As previous research from Walley et al. has found, higher enrollment in the OEND program has a larger effect on fatal overdoses.

PART V: IMPLICATIONS OF THE FINDINGS

This evaluation has further corroborated previous research by finding a slight decrease in fatal opioid overdoses after Massachusetts' counties had opened naloxone training and distribution centers for at least one year. Given the medical benefits of naloxone to individuals experiencing an overdose, this finding was expected, so more areas should follow Massachusetts in implementing similar programs to reduce the mortality associated with opioid use. In this study, the treatment effect represents how human lives were saved, so this effect from the naloxone program provides a compelling reason to enact this policy change. However, this study was limited due to lack of data in a number of areas. For instance, future research could focus on the characteristics of individuals who receive naloxone training and medical kits, along with those who have administered naloxone in a medical emergency. Furthermore, other research could examine difference between counties that could lead to differences in the rate of individuals who have received naloxone training. These trends can lead to further insights on how to address the rising level of opioid overdoses through naloxone access programs.

Future policies should use this type of research to experiment with ways to encourage more individuals to pursue naloxone training if these individuals have a high degree of interaction with people who use and/or abuse opioid drugs. As this program evaluation indicated, increased naloxone access does lower the rate of opioid overdoses throughout a county's population, so any programs that further encourage access could possibly save even more lives. Such incentives could include education

campaigns that emphasize the benefits of receiving naloxone training and administration kits. Reducing and reversing the trend of increasing opioid mortality should receive greater attention from public health experts and policymakers, and expanded naloxone access is one possible solution with proven efficacy.

APPENDIX: FIGURES AND TABLES

FIGURE 1. ANNUAL RATE OF OPIOID USE IN MASSACHUSETTS

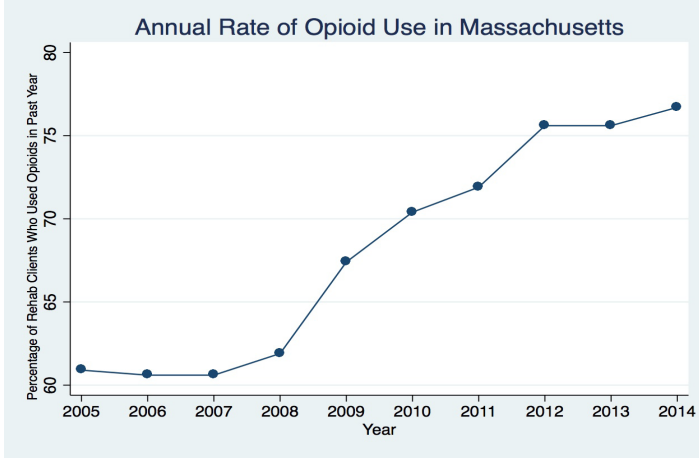


FIGURE 2. ANNUAL RATE OF FATAL OPIOID OVERDOSES FOR EACH MASSACHUSETTS COUNTY

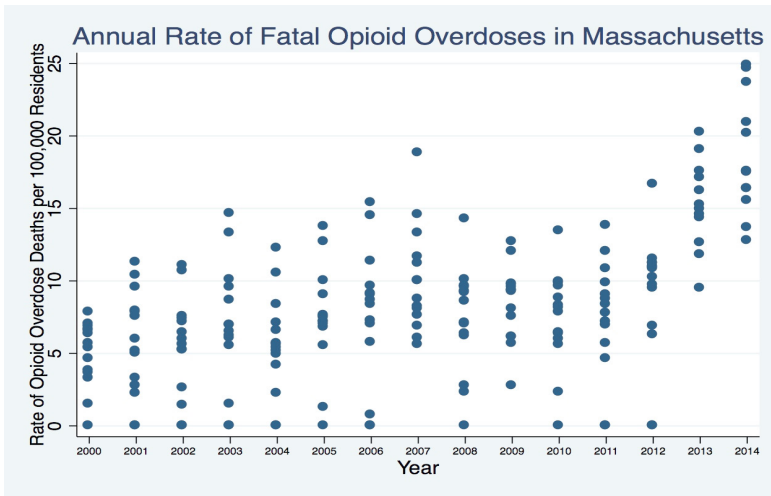


TABLE 1. DESCRIPTIVE STATISTICS FOR KEY CONTINUOUS VARIABLES FROM ALL COUNTIES

Variable	Mean	Std. Dev.	Min.	Max.
Number of Opioid Overdose Deaths	44.36	41	0	257
Rate of Opioid Overdose Deaths	8.31	4.99	0	24.9
Drug Use Indicator*	68.16	6.42	60.6	76.6
Population	464,146	394,837	9,415	1,570,315

*Drug use indicator calculated from the percentage of clients admitted to a rehab program in Massachusetts who reported opioid use in the past year

TABLE 2. REGRESSION RESULTS PERFORMED ON LIMITED COUNTIES IN MASSACHUSETTS WITH THE RATE OF UNINTENTIONAL OPIOID OVERDOSES AS THE OUTCOME VARIABLE

Variable	Coefficient	P-Value
Program	1.2	0.359
Lagged Program *	-1.12	0.091
Population **	-0.00005	0.017
Drug Use Indicator	-4.33	0.194
HIDTA **	6.78	0.013
Barnstable **	-21.052	0.026
Berkshire **	-29.44	0.012
Bristol	-0.486	0.829
Essex	-1.41	0.213
Franklin **	-32.29	0.012
Hampden **	16.94	0.017
Hampshire **	-28.15	0.011
Plymouth **	-14.07	0.026
Suffolk	-1.69	0.299
Year 2007	0.5	0.567
Year 2008	4.56	0.27
Year 2009	29.43	0.185
Year 2010	41.8	0.198
Year 2011	49.53	0.186
Year 2012	67.24	0.175
Year 2013	72.48	0.147
Year 2014	80.88	0.131

Constant	303.98	0.136
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Number of Observations = 120

Note: Counties and years not included as variables were omitted due to colinearity

* denotes significance at alpha-level of 0.10

** denotes significance at alpha-level of 0.05

TABLE 3. REGRESSION RESULTS PERFORMED ON ALL COUNTIES IN MASSACHUSETTS WITH THE NUMBER OF UNINTENTIONAL OPIOID OVERDOSES AS THE OUTCOME VARIABLE

Variable	Coefficient	P-Value
Program	2.49	0.709
Lagged Program *	-7.09	0.082
Population ***	0.0005	0.007
Use ***	3.19	0.001
HIDTA **	-325.16	0.02
Barnstable **	-84.7	0.012
Berkshire **	-58.27	0.006
Bristol **	-193.14	0.034
Dukes **	-2.65	0.018
Essex ***	33.03	0.009
Franklin ***	-32.51	0.002
Hampden **	136.87	0.027
Hampshire ***	-68.08	0.005
Middlesex ***	-311.81	0.013
Norfolk ***	-274.8	0.018
Plymouth **	130.52	0.02
Suffolk ***	49.67	0.007
Year 2006 *	6.96	0.054
Year 2007 *	6.44	0.095
Year 2008	-3.23	0.286
Year 2009 ***	-17.46	0.003
Year 2010 ***	-33.35	0.003
Year 2011 ***	-33.22	0.002
Year 2012 ***	-43	0.002
Year 2013 *	-20.38	0.051
Constant ***	-201.07	0.001

Number of Observations = 136

Note: Counties and years not included as variables were omitted due to colinearity

* denotes significance at alpha-level of 0.10

** denotes significance at alpha-level of 0.05

*** denotes significance at alpha-level of 0.01

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ALL THAT GLITTERS: A META-ANALYSIS OF MICROFINANCE IN THE DEVELOPING WORLD

by Michael O'Grady

ABSTRACT

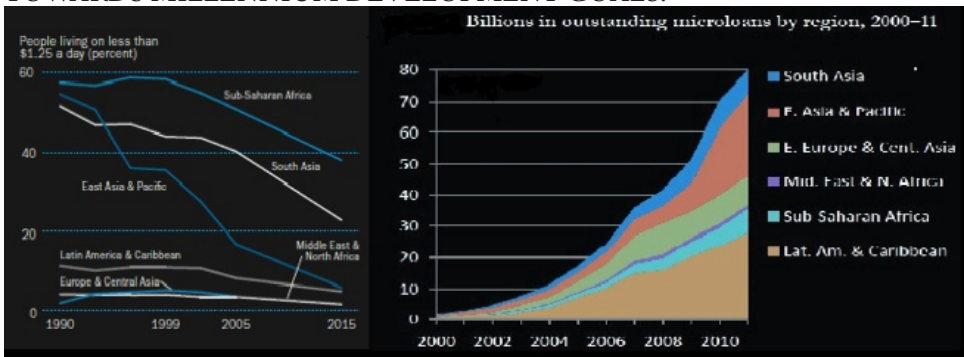
Microfinance has become a popular tool over the last several decades to fight poverty in the developing world. In a meta-analysis combining data from randomized field experiments, quasi-experiments, and market reports from 38 Microfinance Institutions in Africa, Asia, North America, and South America, this paper tests the hypothesis that microfinance alleviates poverty.

Ordinary least squares regression was used to determine poverty rate changes associated with usage of two types of microfinance products: micro-savings & micro-loans. The rate changes were observed over periods of time ranging from two to seven years. The regression showed that on average, micro-loans were associated with a 1.6 percentage point reduction in poverty rates. Micro-savings programs were associated with a 3.19 percentage point reduction in poverty rates. Yet, high standard errors made neither finding statistically significant. Results suggest that in at least in the short-term, microfinance will not significantly reduce poverty.

I. BACKGROUND AND THEORY OF MICROFINANCE

Microfinance is the introduction of formal financial institutions & products into impoverished communities to increase wealth in those communities through use of financial services by the unbanked poor. Its modern history goes back decades when philanthropists in South America and Asia began making loans to low-income groups to start businesses.¹ In 1983 Muhammad Yunus founded one of the first, and to date most successful, microfinance institutions (MFIs), The Grameen Bank in Bangladesh.² Decades later he would win the Nobel prize for his efforts. Today, enthusiasm for microfinance is at record levels from international development stakeholders. Governments and organizations including the United Nations, The World Bank, non-government organizations (NGOs) herald microfinance’s ability to reduce poverty.³ Microfinance funding is at record levels while traditional indicators suggest a decline in poverty rates worldwide.

FIGURE 1. GROWTH IN MICROFINANCE LOANS AND PROGRESS TOWARDS MILLENNIUM DEVELOPMENT GOALS.



Source: The Mix.org & The World Bank^{4,5}

While slowly growing in popularity since its inception, interest in microfinance expanded dramatically when 189 governments signed the Millennium Declaration in the year 2000.⁶ The Millennium Development Goals were meant to be both an umbrella framework to coordinate anti-poverty programs and be a benchmark to judge their success; and Goal

- 1 Global Envision, The History of Microfinance.
- 2 The Guardian, A short History of Microfinance.
- 3 CGAP, Aid effectiveness in Microfinance.
- 4 The Mix, Cross-Market Analysis of MFIs 2000-11.
- 5 The World Bank, World Development Indicators 2010, xxviii.
- 6 ILO, Guide to the New Millennium Development Goals, 11.

I was to eradicate poverty. With a clearly defined goal and a timeline in which to achieve it (by the end of 2015), donor organizations began pouring money into microfinance. As a result new MFIs emerged and existing ones began to scale up their operations.⁷

While there is no formal standard theory of microfinance, common definitions and models usually rely on four basic assumptions. First is the assumption that there is indeed a demand in the developing world for financial products despite the small per-capita income of most the population. This assumption is supported by the prevalence of informal finance systems (e.g. ROSCAs, Susu collectors, Chit funds, and Tontines) in many impoverished countries.^{8,9} The existence of demand is further evidenced by survey-based market feasibility studies conducted by the World Bank that indicate a significant level of interest in formal banking & finance products among the rural poor.¹⁰

The second assumption is that informal financial systems (or none at all) create inefficiency, instability, and vulnerability which prevent individuals from meaningfully leveraging their capital & assets to rise out of poverty.¹¹

The third assumption is that large operating costs, high risk, and the perception of low returns on investment prevent entry into the market by most for-profit firms. Thus, intervention by governments and NGOs to provide these services (or create a market for them) is both necessary and will lead to poverty reduction. Finally, as MFIs become self-sufficient their operating model will transition from a non-profit social organization to a traditional for-profit financial institution.¹² At this point, the intervention will be considered a success (and will taper off) since there is now enough wealth in the community to sustain economic growth endogenously.

However, questions remain about the efficacy of microfinance, its delivery models, and unintended negative effects & externalities. Individual studies show dramatically varying results and often contradict each other both in models of behavior & observed effects. Thus, the need for objective large-scale evaluation remains. This paper helps fill this void by testing estimating the impacts of microfinance on poverty worldwide.

7 The Mix, Cross-Market Analysis of MFIs.

8 Cole et al, Prices or Knowledge? What Drives Demand for Financial Services in Emerging Markets?

9 Global Envision, The History of Microfinance.

10 World Bank, Vietnam: Developing a Comprehensive Strategy to Access.

11 James et al, Microfinance and Community Development, 248-50.

12 James et al, Microfinance and Community Development, 250, 252-59.

II. LITERATURE REVIEW OF MICROFINANCE

As microfinance has become increasingly prominent, a large number of studies on various aspects of microfinance and MFIs have emerged. Trans-national organizations including The United Nations, World Bank, and The Organization for Economic Cooperation & Development have published working papers and technical guidelines for those directly involved in microfinance. Donor organizations like The Bill & Melinda Gates foundation have begun requiring descriptive reports on the projects they fund. These combined with more traditional academic research provide a large pool of studies from which to draw upon. However, the aspects of microfinance being studied vary widely along with differing dimensions of success. This paper divides the existing literature into 3 broad categories: Theoretical Models of Microfinance Market Structure, Tangible Direct Impacts, and Participant Growth.¹³

A. Theoretical Models of Microfinance Market Structure

The market structure for microfinance is still not well understood by current and potential stakeholders.¹⁴ As a result much research has focused on what the market demand for microfinance is or could be, what types of products should be offered, for what purposes (i.e. consumption versus investment), or whether the point of service should be delivered by for-profit firms, NGOs, or government agencies. Laureti & Hamp (2011) observed that the poor are very susceptible to negative shocks, thus will demand microfinance products that offer maximum flexibility.¹⁵ However, they are quick to note that a high demand for flexible finance products does not guarantee a viable business model for an MFI. Operational costs to provide such flexible products (or any) would be very high while expected revenues would be negligible^{3/4} and currently for many MFI's revenue does not cover operating costs, which forces them to rely continuously on outside funding to sustain operations. From a supply side standpoint, the viability of the microfinance market is dependent on a large base of customers to lower long-term average total costs & (marginally) increase stability in the risk pool along with commitment mechanisms for account holders to reduce the probability of default, non-compliance, or other forms of moral hazard. Otherwise, the MFI must be prepared to operate at a loss indefinitely.

Commitment mechanisms take a variety of forms. In most informal

13 The analysis in this paper will focus only on Tangible Direct Impacts (i.e. poverty rates).

14 CGAP, Aid Effectiveness in Microfinance.

15 Laureti & Hamp, Innovative and Flexible Products in Microfinance.

microfinance arrangements (and in a few formal MFIs) peer and social pressures are used to guarantee individual compliance. Access to loans is made in group settings rather than on an individual case by case basis. Here, the entire group is responsible for repaying the loans of all its members. Since these groups are derived from the same community, are self-selecting and interact with each other continually on a near-daily basis, there is a strong incentive for each member to fulfill his/her obligations and to be careful who is allowed to join. For individual products offered by MFIs, commitment mechanisms usually involve some type of compulsory payment depending on the type of product. For those seeking a loan, compulsory payments usually involve either requiring the borrower to open a deposit account (access to which is frozen, usually until the initial loan is repaid) or require the borrower to purchase an insurance policy against default. For those opening a deposit account, large initial lump sum payments are often required as well as compulsory weekly or monthly deposits. Furthermore, access to funds in deposit accounts may also be frozen for a period of time (usually a year). Finally, it should be noted that for products with compulsory mechanisms, the majority of clients are women.¹⁶

In most of the developing world, a significant portion of the economy is informal, especially for women. In this part of the world, some estimates place the average informal economy at 36% of GDP.¹⁷ The International Labor Organization has documented a link between poverty rates and the size of a country's informal economy.¹⁸ Yet even among participants in informal sectors, demand for financial services is high. Research suggests that as more of those in the informal economy become aware of the availability & benefits of formal financial services, demand will grow.¹⁹ When presented with the opportunity to use either informal or formal financial services, a majority of unbanked poor households will chose the later with the belief it is more likely to make them better off.²⁰

While focus of much of the literature in this category is on acceptance rates of a product (e.g. Crepon et al., 2014), it is important to note that market supply, demand, acceptance, or retention rates should not in and of

16 Ashraf, Tying Odysseus to the Mast, 636-7.

17 Cole, Prices or Knowledge? What Drives Demand for Financial Services in Emerging Markets? 2-4.

18 ILO, Guide to the New Millennium Development Goals, 11.

19 Cole, Prices or Knowledge? What Drives Demand for Financial Services in Emerging Markets? 4-5.

20 World Bank, Vietnam: Developing a Comprehensive Strategy to Expand Access, 38-46.

themselves be as signs of successfully reducing poverty. The growing use of pay-day loans in the U.S. by low-earning households is a good example of a negative relationship between demand for (and supply of) a microfinance product and poverty alleviation. Similar examples have been documented in the developing world where participation in an MFI can lead to debt spirals and poverty traps.²¹ Thus, the consumer's purpose for using microfinance must also be considered. Those who take up a microfinance product usually do so either to smooth consumption (i.e. being able to buy the same bundle of goods year after year despite income shocks), make lumpy purchases to make the household better off in the long run (e.g. installing running water or pay tuition for children), or to make business investments and/or improvements. However, this is complicated by the fact most borrowers in the developing world often borrow from more than one source and for different reasons creating multiple-treatment interference when studying the relationship between microfinance and poverty. Thus, identifying the effects of a business micro-loan on poverty reduction is difficult when the borrower has also taken out a separate loan to increase his consumption. (Banerjee & Duflo 2014)

B. Tangible Direct Impacts

Often times, researchers will study changes in possessions or capital that occur after a household has begun participating in a microfinance program. Researchers study these measures because they have the potential to lead to poverty reduction in the future. Measuring these outcomes are very common when a majority of program participants are farmers, fishermen, herders, small business owners, or own-account workers for whom microfinance is used to expand/start a business or make a lumpy purchase. Changes in income, consumption level, asset value, deposit balances, and outstanding debt (which are direct measures related to poverty) are also considered measures of tangible direct impacts for the purposes of this paper.

Crepon noted that in agricultural communities in Morocco, those who benefited from microfinance were likely to be engaged in agriculture or own a business. Using microfinance, farmers were able to increase their yields through additional planting or purchasing equipment. Since farmers in the developing world often grow food or raise animals for household use as well as for sale, this allowed them to increase their consumption without having to reduce their income or purchases of other goods.²² Aportela

21 Mitra, Exploitative Microfinance Interest Rates.

22 Crepon and Duflo, Estimating the impact of microcredit on those who take it up.

noticed a similar phenomenon in rural Mexico among those who participated in Panhal, consumption among subsistence farmers increased without negatively affecting income or increasing debt.²³

C. Participant Growth

Many non-profit and charitable organizations study the impacts of their microfinance programs by measuring changes in household or individual behavior since the program was enacted. While not directly measuring the effects on poverty, these indicators can be predictors of trends that might lead to economic growth or a reduction in poverty in the future. Such indicators include the number of participants who graduate from an educational or training program associated with an MFI, the number of participants who are active account holders after a given period of time, increases in access to medical care, whether or not children in a participating household attend school, change in household debt, whether or not females enter into under-aged or arranged marriages (because of economic reasons).

In a quasi-experimental study of households in the Philippines, The Asian Development Bank (ADB) found that status of women in households improved significantly for a majority of those who were receiving a microfinance loan and household consumption increased.²⁴ Banerjee & Duflo found that while participation in an MFI did not change the level of consumption, the nature of the bundle consumed changed with unnecessary purchases being reduced in favor of durable goods.²⁵ There is additional evidence that microfinance programs with commitment mechanisms lead to other types of behavior modification. Ashraf noted that restricting both the dates and the amount that deposits could be accessed encouraged participants to become more aware of future costs, building up financial discipline and long-term planning ability among participants.²⁶

Other research has noted that microfinance can be used as an incentive to have participants avail themselves of social services they otherwise would not have. In Peru, De Los Rios observed that women participating in an MFI that also offered life insurance and financial training were much more likely to purchase life insurance or start a business than those in the control

23 Aportela, Effects of Financial Access on Savings by Low Income People.

24 ADB, Effect of Microfinance Operations on Poor Rural Households and the Status of Women, 55-6. 78-80.

25 Banerjee et al., The miracle of microfinance? Evidence from a Randomized Evaluation.

26 Ashraf, Tying Odysseus to the Mast.

group.²⁷ In Malawi, those who had deposit accounts in an MFI were more likely to either give or loan out money to relatives who suffered a loss. Thus preventing the need for the family go into debt or forgo a vital purchase (e.g. a medical procedure).²⁸

However, it should be noted that outcome variables reported in these types of studies cannot directly answer question “are these programs alleviating poverty?” To date, there are no known models that successfully use participant growth vectors as instrument variables for direct tangible impacts. The ADB found that in the short-term, income levels actually diminished in their QE and the program itself was not self-sufficient. De Los Rios lamented that the difference in wealth between groups in Peru was negligible and was not likely to attract new MFIs into the market even though she considered the program to be a success.

III. HYPOTHESIS AND EXPERIMENTAL DESIGN

Though most anecdotal accounts (to date) are promising, microfinance must ultimately be judged by lasting tangible improvements in the lives of those who participate. Given the discussions in the previous sections, it is hypothesized that participation in an MFI alleviates poverty for who take up the program. This paper tests this hypothesis by using meta-analysis to measure the change in poverty rates among participants in 38 MFIs in the developing world.²⁹ Meta-analysis was chosen because microfinance goes back decades and there exists a large pool of studies for review, though the preceding section highlights the difficulties in focusing on a single outcome variable. Furthermore, there is conflicting evidence on whether microfinance is actually an effective tool to fight poverty. Many studies show high returns in certain areas and demographics (Brune et al 2011; Duflo, Kremer and Robinson 2008). Other studies link microfinance to increases in poverty or show the impacts are not statistically significant (Mitra 2009). Meta-analysis will be able to synthesize these results into a more conclusive finding.

This paper uses three sets of sources of data for its meta-analysis. The first set is Randomized Field Experiments (RFE’s) conducted by academic researchers in conjunction with a pre-selected MFI. The second set is quasi-experiments (QEs) conducted by trans-national organizations,

27 De Los Rios, Synergetic affect of micro savings and micro insurance on vulnerability.

28 Flory, Micro-Savings and Informal Insurance in Villages.

29 For the purposes of this paper, the developing world is defined as nations in North America, South America, Africa, and Asia; countries with either a low GNI Per Capita (adjusted for PPP) or the recipient of substantial international development aid.

academics, or donor organizations. The third set is non-experimental data (NE's) compiled by MFIs and submitted as part of their annual reports to donor organizations. While this third set was the most complete and plentiful source of information measuring changes in poverty, its inclusion is also the riskiest for internal validity. Since the data is collected from the total MFI client pool for each year by product type, there is no way to be certain that those used for baseline analysis were included at the end and vice versa. In an attempt to mitigate this, periods of time for analysis were chosen so that the number of clients throughout were roughly comparable (i.e. the numbers in the pool did not differ dramatically). Literature suggests that the vast majority of MFI clients will remain clients in good standing with an MFI for many years in order to continue receiving services, making it highly likely the bulk of clients were included in both measures.³⁰ Thus the benefits of including this third set outweigh the risks, especially given the paucity of publicly available data from other sources that directly measure changes in poverty.

TABLE 1. DESCRIPTIVE STATISTICS OF DATA BY REGION, PROGRAM, AND EXPERIMENT TYPE.

	Countries	Micro-savings Programs	Micro-loans Programs	RFEs	QEs	NEs	Mean Sample Size
North America	7	3	7	0	1	8	41,471
South America	4	3	4	0	0	7	12,514
Africa	6	1	7	2	0	5	30,416
Asia	7	4	9	2	5	8	28,469
Total	24	11	27	4	6	28	30,032

Mean Sample Size	24,975	32,440	3,949	3,931	42,592
Mean Years of Study	2.92	2.8	2.25	3.17	3.76

The theoretical equation for this analysis is as follows:

$$\Delta \text{Poverty Rate} = \alpha + \beta(\text{program type}) + \zeta(\text{Commitment Mechanism}) + \lambda(\text{program years}) + \delta(\text{percent female}) + \Omega$$

Description of Theoretical Variables

Poverty Rate: This is the percentage point change in participants considered to be below a poverty line. When possible, this was measured using (or converted to) the \$1/day consumption threshold set by the World Bank. However, some studies used either a national index or a program proprietary index instead. Since the methodology for calculating these indices was not disclosed, converting them to the World Bank consumption threshold or creating a universal standardized score was not possible. All studies included used the same index type for pre and post-test comparison.

Program Type: This is a dummy variable equaling 1 when the program is micro-savings and zero otherwise. α is the estimate of the average effect size when the program is a micro-loan, β is the estimate of the difference between micro-loan and savings programs. α is hypothesized to be negative since the bulk of literature suggests that microfinance reduces poverty levels. It is also hypothesized that β is negative and significantly different from α .

Commitment Mechanism: This is a control variable equaling 1 when participation in the MFI required a commitment mechanism and zero otherwise.

Program Years: This is a control variable representing the duration of years of the study.

Percent Female: This is a control variable for the number of participants in each study that are female. In studies where there are different before and after percentages, the average of the two are used.

Ω : This is a stochastic term assumed to be normally distributed.

IV. RESULTS

Parameter estimates were made using ordinary least squares

regression (OLS). The regression found that participation in a micro-loan program reduced the number of participants living in poverty by 1.6 percentage points while participation in a micro-savings program reduced the poverty rates by 3.19 percentage points, furthermore the inclusion of commitment mechanism reduced poverty by an additional 1.8 percentage points. However, these results were not considered statistically significant. (See Table 2) This paper fails to reject the null hypothesis that microfinance has no impact of poverty levels. Furthermore, this paper also fails to reject the null hypothesis that micro-savings does not differ significantly than micro-loans. In other words, it does not appear that either of these programs are achieving their goal of reducing poverty (in the short-term). Also of note is that the variable for commitment mechanism had a higher parameter estimate and lower p-value than the program variables.

TABLE 2. OLS ESTIMATES OF THE THEORETICAL MODEL.

	Coefficient	P-Value
Micro-Loan	-1.6	.81
Micro-Savings	-3.19	.47
Commitment Mechanism	-1.8	.37
Years of Study	.98	.39
Percentage Women	-.03	.67

V. DISCUSSION

The primary threats to both the internal and statistical validity of the results involve the quality of data collected. While the sample sizes for each source were deemed large enough for accurate hypothesis testing, in meta-analysis the unit of observation is the number of studies not their sample sizes. Here the problem of the limited number of studies publicly available directly measuring the impact of microfinance of poverty rates presents itself, though it is likely many development and donor organizations have additional data outside the public domain that can be used in future analyses. Thus, this paper relied mostly on market data. Furthermore, little interest in studying micro-savings also created an imbalance where data points for micro-loan programs outnumbered micro-savings by approximately 2:1.³¹ Furthermore, there was little variation in the number of years of each study period. Most studies were

for either 2 or 3 years, allowing for very little variance to estimate the impact time has on the effects of microfinance; the only outlier was a QE study of the Grameen Bank which lasted 7 years. Thus even if the null were rejected, the estimates would only be valid for short-term effects. Because of these data issues, it is not surprising that high standard errors were observed in the regression. However, it is important to note that all the signs were in the expected direction; making it highly plausible that there are long-term effects.

One common characteristic in the sources used is that they all employ self-reporting survey data as their measurement instrument. There was likely little to no effort to verify the accuracy of the information reported due to the costly and burdensome nature of such a procedure. While this certainly contributed to a great deal of noise, there is no reason to believe it systematically biased estimates. However, it is likely there was some degree of measurement bias in the poverty indicators. Most poverty indices involve whether a household is able to consume a certain bundle of goods deemed necessary for a basic standard of living. The World Bank \$1/day consumption index, which has since been adjusted to \$1.25/day, was chosen for this study because it is the most widely used. However, it is fairly arbitrary since meeting this threshold does not guarantee the minimum bundle can be consumed. Recognizing this, many stakeholders use their own index but there is no way to be certain these new indices solve the underlying problem (even when their methodology is disclosed and can be reviewed).³² Thus the use of currently available poverty indices likely biases downwards the true rates of poverty. However, the bias present in both pre and post-test measures is likely the same. Hence, the actual change in poverty is likely to be unbiased.

Despite issues of internal and statistical validity, the underlying finding in this analysis (that on average microfinance has no significant short-term poverty reduction in the developing world) is likely accurate for two reasons: First, the countries included are geographically, ethnically, and politically diverse-- giving the sample a high degree of external validity. Second, the “noise” observed in this analysis is similar to mixed observations of financial growth in lower income households in the developed world. Between 2010-13 (about the average time period of analysis in this study), the Federal Reserve noticed similar asset growth and decreases in nominal poverty indicators in banked poor households in the U.S., yet high standard errors were present in the data.³³ Meanwhile

32 Progress Out of Poverty, About the PPI.

33 Federal Reserve Bulletin, Changes in U.S. Family Finances from 2010 to 2013, 9-14.

sociological indicators (e.g. health status, education, and consumption) presented a different story;³⁴ suggesting the results of this meta-analysis would be consistent with similar observations of financial portfolios of low-income earners in the industrialized world. This leads to a basic theoretical question about the current structure of microfinance that needs to be addressed: Why should stakeholders expect microfinance to perform much higher and with faster results in the developing world than similar products in industrialized nations?

VI. CONCLUDING THOUGHTS

Noted previously in this paper, the divergence of inputs and outcomes measured by studies evaluating microfinance makes a thorough evaluation of the impact on poverty extremely difficult. While there does seem to be some convergence in microfinance evaluation, it appears to be concentrated in the market structure and participant growth aspects. There seems to be no systematic effort being undertaken to see whether or not these anti-poverty programs are actually alleviating poverty.

This is symptomatic of a “silver bullet” mentality that is prevalent in the international development community at large. It seems to be taken as an article of faith by many that microfinance (as currently structured) will work (eventually) and program evaluation measuring direct changes in poverty is not necessary.³⁵ The mentality seems to be that research should focus instead on what needs to be done to coax and cajole the impoverished into microfinance programs and keep them there, without enough thought to whether they should be there. This dangerously ignores the fact that poverty is a multi-faceted, complex, and complicated problem that has existed since the dawn of civilization. For wicked problems such as poverty there are no silver bullets, only coordinated multi-pronged, very gradual, resource consuming, intensive efforts. In his book *Naked Economics*, Charles Wheelan notes that in order for financial markets (and by extension MFIs and microfinance) to work, many other things need to be in place: consumers need to fully understand the benefits and risks of financial products (and what forms they will take), government must have a strong (but not burdensome) regulatory framework to guard against moral hazard & information asymmetries, and most importantly there needs to be real, existing, underlying economic growth & activity.³⁶ At best

34 Irwin, *So Why Hasn't Poverty Declined?*

35 Sanga, *The Challenges of Monitoring and Reporting on the Millennium Development Goals.*

36 Wheelan, *Naked Economics*, 54-60, 148-53, 294-316.

microfinance is just one prong in a larger intervention; while potentially beneficial on its own, it would likely work best as an accelerant for other impacts.

The results of this analysis are not necessarily evidence of the failure of microfinance to alleviate poverty, even in the short-term. Again given the signs for the program variables were all in the expected direction, it is more likely than not these programs do have an impact. This paper fails to reject the null hypothesis, it does not imply that MFIs fail to reduce poverty. Instead it only confirms that microfinance is still unproven (as is what form the products & services should take). However, given the opportunity costs associated with funding and participating in MFIs, it is imperative to remedy this sooner rather than later. Failure to do so will likely mean more people will live in poverty longer because stakeholders are essentially “flying blind.”

But this raises another important question for which there is no consensus: How long should we wait after the introduction of a microfinance program to evaluate its success? Given the difficulties of reliably and consistently collecting data in the field, this is as much a technical question as it is a theoretical or political one. This challenge, to borrow from Atul Gawande, “Doesn’t mean that ambitious reform is beyond us. But we have to start with what we have.” To get to Millennium Development Goal 1, we have to start by consistently, objectively, systematically, and directly evaluating the impacts of microfinance on poverty; and to make sure we are using this tool the right way and in conjunction with others.

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FROM HOBBY TO HAZARD: ADDRESSING THE OVERPOPULATION OF DOMESTIC DRONES IN THE NATIONAL AIRSPACE

by Abieyuwa Osamwony

ABSTRACT

Domestic drones are becoming more and more popular in the United States. The FAA did not expect the exponential boost in drone presence within its airspace in the first half of 2015. Drones have now become a safety concern for manned flight throughout the country. This paper will explain why there is overpopulation in the airspace and provide recommendations to help remedy the problem. Due to market innovation, lax regulations, and genuine curiosity, the market for the drones has grown quickly. As materials become cheaper, more competition is allowed to enter the market. With prices going down, demand is increasing. The FAA will need to create regulations that will act quickly to address the problem before it is too large to handle. This paper recommends that the FAA mandates registration of all drones in the airspace and create geo-fences to keep drones out of safety hazard zones.

INTRODUCTION

Background

Unmanned Aircraft Systems (UAS) or “drones” are becoming a threat to domestic airspace security. In 2014, there were 238 reported near accidents or drone sightings above their legal elevation ceiling¹. Between the months of January and August 2015, there have been 650 similar situations¹. That is a 173% increase within the first half of this year. With these staggering numbers, there has been increased pressure put on the Federal Aviation Administration (FAA) to create new policies to contain the rapidly evolving domestic drone market. The FAA estimates that there will be more than 30,000 UAS in our airways by 2030². The market is rapidly increasing and the FAA needs to speed up its policy making pace. Commercial drones, which are used for research and other non-personal uses, need to obtain FAA authorization to be able to fly³. The owners have to provide detailed information on the drone’s design and also on the purpose of its use³.

The regulations currently state that the person in command of the drone must possess an airline transport license, which may be commercial, recreational, private, or a sport pilot certificate⁴. They must also hold a valid US driver’s license or a current FAA airman medical certificate⁴. This makes it easier for the FAA to track commercial UAS use and also a method of limiting it. There are looser guidelines for recreational drones. There are suggested guidelines on the FAA website, but recreational users do not have to register their UAS. One of the guidelines states that the drone is not to be flown within five miles of an airport, without airport consent⁵. Of the 650 cases of near accidents or sightings, 552 of them had the distance from an airport recorded, and out of the 552 reports, 58.6% of them occurred within five miles of an airport⁶. Another guideline states that the highest altitude a personal drone can be flown is 400 feet. There were 627 cases in which the altitude was recorded and 90.1% were above the recommended 400 feet⁶.

1”Drone Sightings and Near Misses.” Center for the Study of the Drone. Bard College, 28 Aug. 2015. Web. 17 Sept. 2015. <<http://dronecenter.bard.edu/drone-sightings-and-near-misses/>>.

2 Barbee, Melissa. “UNCHARTED TERRITORY: THE FAA AND THE REGULATION OF PRIVACY VIA RULEMAKING FOR DOMESTIC DRONES.” *Administrative Law Review* 66.2 (2014): n. pag. Web.

3”Civil Operations (Non-Governmental).” Federal Aviation Administration. Federal Aviation Administration, n.d. Web. 17 Sept. 2015. <https://www.faa.gov/uas/civil_operations/>.

4”Section 333 Frequently Asked Questions (FAQ).” Federal Aviation Administration. Federal Aviation Administration, n.d. Web. 17 Sept. 2015. <https://www.faa.gov/uas/legislative_programs/section_333/333_faqs/#q12>.

5”Civil Operations (Non-Governmental).”

The biggest concern with the current guidelines is that we are still seeing the majority of recreational users in violation of them. If left unresolved, this issue will only become worse as drone numbers increase, especially as they are becoming cheaper to produce and more available to the public⁶.

Major Causes/Contributing Factors

The systems map, in Fig. 1, illustrates major contributions to the problem. The four main categories are: policies, market innovation, actors, and material/equipment. The policies show inconsistencies among the different uses of domestic drones. Section 333 of the FAA Modernization and Reform Act (FRMA) outlines the requirements necessary for a UAS to be granted grant flight permission⁷. UAS used for commercial/business purposes may be granted an exemption to Section 333 if they provide extensive information describing the drone, its purpose, and who will be piloting it. The numbers of exemptions are recorded in the FAA's database and businesses cannot re-use an exemption for another drone they own⁸. A special certificate can be granted to a UAS used for experimental purposes. The experimenter will have to provide the FAA details on their experiment, how long it will be happening, and on the UAS itself. The FAA then determines if it is okay for the UAS to operate⁸. The inconsistency occurs with the recreational drone use policy. Consequences, for violating safety regulations, are not being enforced. Under current policies, these drones do not need permission from the FAA to fly.

Drones are becoming easier to make and operate, and the materials used to create them are easy to obtain⁹. They use common materials which will be attractive to producers who want to enter the market at a relatively low cost⁹. The U.S National Airspace System (NAS) is a very complicated entity, in which any unpredictable change in activity can result in an accident¹⁰. This complication contributes to why the introduction of more drones than expected is adding to the problem. Market innovation has changed the options available for aviation services. Different jobs that people would hire pilots for could be done for a lower price with a UAS. There are also different uses for UAS, due to the expansion of the market⁹.

⁷"Section 333 Frequently Asked Questions (FAQ)."

⁸"Section 333 Frequently Asked Questions (FAQ)." Federal Aviation Administration. Federal Aviation Administration, n.d. Web. 17 Sept. 2015. <https://www.faa.gov/uas/legislative_programs/section_333/333_faqs/#q12>.

⁹ Barbee, Melissa. "UNCHARTED TERRITORY: THE FAA AND THE REGULATION OF PRIVACY VIA RULEMAKING FOR DOMESTIC DRONES." *Administrative Law Review* 66.2 (2014): n. pag. Web.

The main actors also contribute to this problem. UAS operators are not following current regulations, which greatly impacts the safety of the NAS. Manufacturers may not be doing their part to inform their consumers about proper use of their drones. Manufacturers are also selling more drones this year than past years, which means that the uninformed public is increasing in size. The FAA has not been quick to create a more comprehensive measure for regulating the market. To address things properly, the FAA should pursue a policy that combines mandatory registration and the installation of geo-fences for recreational drones.

PROBLEM SCOPE

This issue fits into several failure frameworks. To begin with, there are negative externalities that result from the exponential increase in the use of drones. These externalities include damage costs to manned aircrafts if there is an accident, increase in “visual pollution” if there are too many drones in the sky, and loss of job opportunities for pilots of manned aircrafts. Different jobs that are typically given to pilots would be diverted to drones. Examples include crop dusting on fields or aerial photography at an outdoor event. With the last externality in mind, this could lead to rent seeking on behalf of pilots. Positive externalities can result from job diversion, especially in the research field. Drones can be sent to dangerous areas that would be unsafe for a manned aircraft, and this can lead to new discoveries. They can also lead to a new set of job availabilities, since commercial drones require that the person flying them has a pilot license¹¹.

There is also an issue with uncertainty in the form of moral hazards. When consequences are not given to drone users for violating the guidelines, they will continue to engage in the same risky behavior. This behavior can lead to accidents and also misinformation to their peers. When the FAA created regulations for commercial and recreational drone use in the past, the market was not as large as it is now. It is possible that a lack of foresight could have led to this allocative inefficiency when creating current drone policies, or it could have been genuine uncertainty about the market’s development. On top of the safety concern in the airspace, there are also privacy concerns among civilians.

¹⁰ Google UAS Airspace System Overview (n.d.): n. pag. NASA. NASA. Web. <[http://utm.arc.nasa.gov/docs/GoogleUASAirspaceSystemOverview5pager\[1\].pdf](http://utm.arc.nasa.gov/docs/GoogleUASAirspaceSystemOverview5pager[1].pdf)>.

¹¹ “Civil Operations (Non-Governmental).”

There is an ongoing conversation about whether or not the FAA is the right entity to address privacy concerns associated with drones¹². The FAA has solely been responsible for the US airspace and its safety, but not civilian privacy. Without the help of other departments focused on privacy, this leads to a lack of cooperation and coordination.

POLICY OPTIONS

Status Quo

Recreational UAS currently do not require any permission from the FAA to fly. There is a list of regulations set forth by the FAA to establish safe flight boundaries. The regulations state that drones are not to fly within 5 miles of an airport, and must fly below 400ft¹³. The aircraft must also remain within sight at all times, and cannot be flown around people or stadiums. If operation of the drone results in the endangerment of people or other aircrafts, the operator may be fined¹³. The problem with the status quo is there has been lax enforcement. People are not being tracked down when their drones are found in unauthorized areas. Fines are not being administered, so the reckless behavior has been continuing.

*Mandatory Registration*¹⁴

New drones will come with a unique identifying marker or chip that is connected to a unique registration number. Upon purchase, consumers would have to register their information to link with their drone. The FAA will create a database to contain all of this information. For older drones, an identification sticker will be mailed to the owners from the manufacturer. If you created a drone yourself, you can request a registration code from the FAA. The FAA will set forth a day in which all drones have to have some sort of marker on them, or they will be confiscated. Ideally, if a drone is found in a “no-fly zone”, then the owner can be tracked down and fined accordingly. This should discourage inappropriate drone use.

Geo-Fencing

New drones would have a chip installed that contains geo-fence boundary instructions.

¹² Barbee, Melissa. “UNCHARTED TERRITORY: THE FAA AND THE REGULATION OF PRIVACY VIA RULEMAKING FOR DOMESTIC DRONES”

¹³ “Model Aircraft Operations.” Model Aircraft Operations. Federal Aviation Administration, n.d. Web. <https://www.faa.gov/uas/model_aircraft/>.

¹⁴ Task Force Recommendations Final Report. Rep. Federal Aviation Administration, 21 Nov. 2015. Web. <https://www.faa.gov/uas/publications/media/RTFARCFinalReport_11-21-15.pdf>.

Geo-fencing is part of a software program based on GPS coordinates¹⁵. It is a virtual boundary that would cause a drone to cease function, when crossed. With this in place, drones would be prevented from going too high into the sky and too close to airports. The FAA can also go the extra step and have virtual fences around major stadiums, government buildings, and other high profile locations. For older drones, there would have to be a subsidy given to manufacturers to allow them to install the chip. The FAA can also put together a team in different areas that can install a protected exterior chip, which would just contain the geo-fence software, if manufacturers are unable to do it or the drone is self-built. A date will be set force for all drones to contain geo-fence software. Non-compliance can result in confiscation.

Mandatory Training with Licensure

The FAA will create a standard curriculum that each drone training program has to follow. This would be similar to the process of receiving a driver's license. Consumers who wish to purchase a drone will have to watch an instructional video going through the basic information on regulations. The video will be administered at a registered testing site and the site will also give a short quiz covering the key points. To go along with the instructional video, there will be an aviation test in which participants will practice using a drone, so they have some knowledge of how one flies before obtaining one. Producers would request the ID number of the course completion license before selling a drone. After that, the ID number will be linked to the drone, and the owner can be contacted if the drone is being used inappropriately. Similar to getting points for tickets and traffic stops with your driver's license, the drone license would also receive points for each misdemeanor. After a certain point threshold, the owner will have to attend remedial courses or face having their license confiscated.

CRITERIA/INDICATORS

The first policy goal will be to maintain safety in the airspace. The criteria will include reducing the number of drone near-misses in the airspace and reducing the number of drone sightings in the "No Drone Zones" around airports. While "No Drone Zones" can be designated to many areas and events, airports are consistent in location and therefore provide an easy form of tracking any changes to last year's sightings report.

¹⁵ Rouse, Margaret. "Geo-fencing (geofencing)." Whatis.com. Whatis.com, Sept. 2015. Web. <<http://whatis.techtarget.com/definition/geofencing>>.

Near-misses are not airspace accidents, but close encounters in the air. These could be measured over time by pilots and compared to last year's numbers under the status quo policy. The second goal will be to maintain steady market growth. None of our policies should push towards shutting down the market, because domestic drones have been shown to be beneficial for many things¹⁶. Our goal should be to steady the growth of the market, so it is easier to regulate. The criteria for this would be the barriers to market entry and the percent change in drones sold.

Our third goal is to minimize the cost of implementation. The indicator for this criterion will be general estimates of how much each policy option will cost to implement. The estimates will show which costs are shared by both consumers and producers. Costs estimates also tie into our fourth goal, which is the examining feasibility of the policy. The criteria for this are public acceptability, and technical feasibility. For public acceptability, we will take note of possible effects of the policies on consumers and producers. It is important to understand how the public will respond to a policy change because for the policy to be effective, the general public must be willing to adhere to it. The indicators for technical feasibility will depend on the policies chosen. It will be determined if we have the current technology to implement any modifications to the drones, if necessary. It is also important to take note of whether all drones have the capacity for further modifications, since there are many types.

OUTCOMES

The outcomes matrix in Fig. 2 shows a comparison of each policy option in respect to how well they fit the criteria for each goal. The status quo policy serves as a comparison baseline for the other options. All cost projections will be relative to the status quo budget. Mandatory registration will have a low/medium effect on reducing the amount of near-misses and drone sightings. It is highly dependent on how many people follow the policy and how many people are deterred by the possibility of being fined.

The FAA will incur a low cost of implementation because creating a database is not new technology. They already have a database that holds information on commercial drones used for business. Producers will also incur a low cost for creating a unique identifying marker, which may be a sticker or physical marker. Consumers will be sacrificing a bit of their time to register, but registration will ideally be a quick process. There

¹⁶ Jenkins, Darryl, and Bijan Vasigh, Dr. The Economic Impact of Unmanned Aircraft Systems Integration in the United States. Publication. N.p.: n.p., n.d. The Economic Impact of Unmanned Aircraft Systems Integration in the United States. Association for Unmanned Vehicle Systems International, Mar. 2013. Web <<http://www.auvsi.org/auvsources/economicreport>>.

are minimal barriers to market entry with this policy, due to producers having to do a light modification to their designs and there will also only be a slight reduction in the amount of drones sold. The process of linking a registration number with a person's information can be easily done and because there are other lifestyle technology that require linking information, the public should be accepting of this policy. There may be a few privacy concerns, but not in the majority. Mandatory registration will also address the moral hazard issue. People will have more responsibility, so they will be less reckless with their drone usage.

Geo-fencing produces a large reduction in the number of near-misses and drone sightings. With the virtual fence in place, it will be difficult for any chipped drone to go past the boundaries. Costs will be high for the FAA because they will have to develop the basic software parameters and also have a plan in place for long-term maintenance of these boundaries, if they change. Producers will incur a medium/high cost, depending on how large their company is, because they will have to create and install a GPS chip that fits the FAA's standard. There is also a chance that many drones have a GPS chip in them already, for navigation purposes, which will make it easier to install the geo-fence software. Costs of production can be shifted on to consumers, increasing the market price of drones. There will be some barriers to market entry because drones that do not fit the new market standard will not be marketable. Smaller companies may opt out of getting into the market. There will be a medium reduction in the amount of drones sold due to fewer producers in the market and a higher selling price. A geo-fence is feasible to implement with our current technology, but the problem is figuring out how to standardize the software, what effect they want to occur when the drone hits a fence, and where boundaries should be placed. In terms of public acceptability, it will be on the lower end or towards the middle, depending on how widespread public outrage is from hobbyists and those who feel that their freedom is being restricted.

Mandatory Training with licensure will have a medium reduction in near-misses and drone sightings. Implementation costs will be low, since it's just a matter of finding staff to administer and create training programs. Costs of creating new licenses will be included as well, unless the FAA opts to have a digital license. Producers and consumers will both have minimal costs. Consumers will have to pay a fee for the license course, but since it is a short program it will not be a large sum. There will be minimal market entry barriers because the drones will undergo a slight modification, like with registration. A license mandate also comes with an age requirement, and this will lead to a medium reduction in the amount of drones sold.

Some consumers may not be willing to invest time in the training program. A training program is technologically feasible; we already have similar ideas in existence. The age restriction might bring some public backlash, but creating a new job market will boost public acceptability. The new job market would consist of people that administer the training programs. This also doubles as a positive externality of this policy as well.

RECOMMENDATION

Geo-fencing gives the most promise for increasing the safety in the airspace, but it is also the most expensive to implement and holds a higher risk of public backlash. Geo-fencing also helps to stabilize the market by reducing the amount of drones sold by the most. Mandatory registration holds the lowest costs, but does little for increasing safety and market stabilization. Registration is the easiest to implement and more acceptable with the public. Mandatory training with licensure holds the risk that people will not want to invest time into the training program, but it does have a larger effect than registration on increasing safety. While mandatory training will have a similar effect as geo-fencing on decreasing the amount of drones sold, it does not help with creating barriers to market entry. With all of this in mind, the recommendation is to combine mandatory registration and geo-fencing.

This recommendation stems from the fact that mandatory registration can be implemented in the short-term, and geo-fencing in the long-term. In the time it takes the geo-fence to be implemented, consumers can be properly informed on what a geo-fence is and how it can actually help save them from being accidentally fined. This will help minimize any public backlash. Mandatory registration requires a unique identifier and this can also be the GPS chip used for geo-fencing. Ideally, the mandatory registration will boost the compliance effects of the geo-fence. Figure 3 shows a logic model utilizing the combined policy option. The logic model gives the policy combination a better platform to work with because it shows how compliance with the geo-fence actually helps consumers. Fine protection from the geo-fence will help counteract any negative thoughts about mandatory registration being a source of income. The combined effort gives a lot of different ways to increase the safety in the airspace, which is our largest goal. The logic model is limited due to working off assumptions that may not be the actual reality of what will happen if implementation occurs.

APPENDIX

FIGURE 1: SYSTEMS MAP

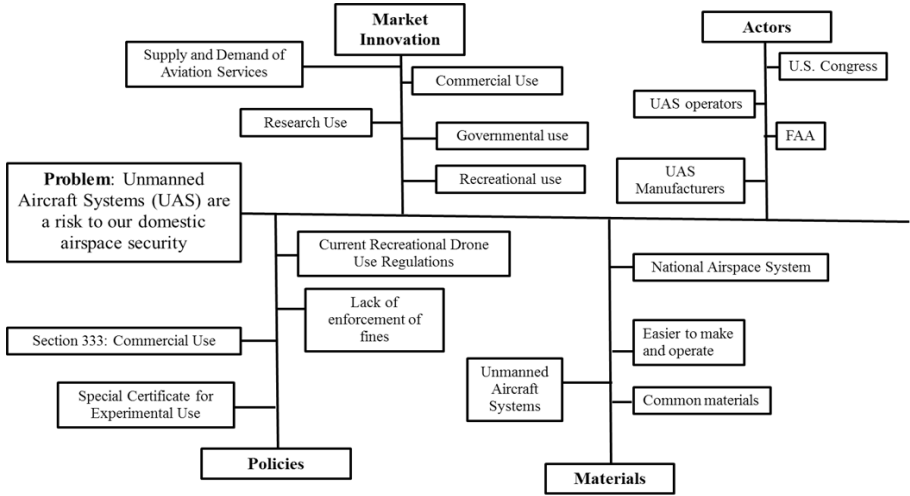


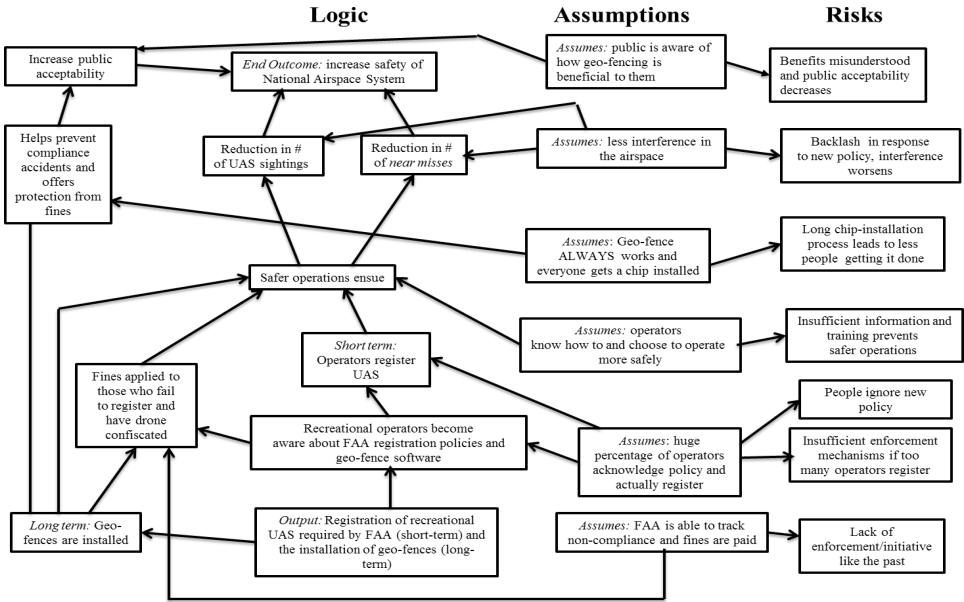
FIGURE 2: OUTCOMES MATRIX

Goals	Criteria	Policy Options			
		Status Quo	Mandatory Registration	Geo-Fencing	Mandatory Training with licensure
Maintain Safety	Reduce number of near-misses	Baseline	Low/medium: registration may cause people to look up information on regulations to avoid being fined	High: drones will be fenced out of areas	Medium: Training leads to regulation education
	Reduce number of sightings in a "no drone zone"	Baseline	Low/medium: people become more aware of no drone zones and keep their distance	High: drones will not be able to enter the zone	Medium: Training leads to regulation education
Cost to implement	Monetary	Baseline	Low: cost of creating a database to hold and maintain all the information	High: cost of employees to define boundaries, and long-term maintenance	Medium: finding staff certified to create/ administer training program and cost of creating new licenses

Cost to consumers/producers	Monetary	Baseline	Producers: (low) cost of creating a unique identifier for the drone Consumers: (low) time needed to register	Producers: (medium/high) cost of installing technology in drone that abides by geo-fence regulations Consumers: (low/medium) costs shifted from producers	Producers: (low) cost of creating a unique identifier Consumers: (low) extra fee for license & training program
Steady Market Growth	Barriers to market entry	None	Low: slight modification to the drone, so companies should not be deterred	Medium: modifications may deter smaller companies with less capital for business	Low: slight modification to the drone, so companies should not be deterred
	Change in % of drones sold	Baseline	Low reduction: some consumers may have a privacy concern, but not large enough to have a significant change in the % sold	Medium reduction: mainly in part from less producers in the market	Medium reduction: with licensing comes an age requirement, and some consumers may not be willing to invest time in the training program
Feasibility	Technical Feasibility	High	High: modifications can occur with relative ease, just need time	Medium: figuring out boundaries, authorizations, which geo-fence effect to use on the drones (shut-down or retreat)*, how to standardize drones to oblige	High: training videos/ programs are made all the time for different types of machinery; license creation is not difficult
	Public Acceptance	High: Note, due to the number of regulation violations, it is possible that many people do not know of the current policies	Medium/High: people already register other hobby/lifestyle technology under their name (FitBits, tablets, etc); no extra fee to register, but possible privacy/tracking concerns	Low/Medium: restriction of freedom of use; outrage from producers and hobbyists who create their own drones	Low/Medium: age restriction may cause public outrage and hobbyists will be unhappy; new job market creation may lead to increased acceptance

*Shut down or retreat means that they have to pick between the drones automatically shutting down when they hit a geo-fence or the drone simply retreating away from the fence. The latter being the more ideal for the feasibility goal.

FIGURE 3: LOGIC MODEL



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NATIONAL FAMILY CAREGIVER SUPPORT PROGRAM'S RESPITE SERVICES AND THE EFFECT ON THE CAREGIVING EXPERIENCE

by Jourdan Davis

ABSTRACT

This study uses data from the National Family Caregiver Support Program portion of the National Survey of Older Americans Act Participants (n= ~4,800) to explore the relationship between respite care and caregiver burden. The study found that participants of respite care were significantly more likely to report that they had more time for personal activities, found it easier to care for the care recipient, and felt less stress as a result of receiving respite care services. These results are consistent with some literature; however, there are some studies that do not support the positive effects of respite care. Studies have linked these mixed results with deterrence from using respite care, and therefore more research is needed in order to appropriately meet the needs of caregivers. Although this study found that respite care led to positive and significant outcomes for caregivers, previous studies have not found that respite care yields positive outcomes for caregivers. These mixed results on the value of respite care may be due an inconsistency in the definition of respite care across programs and states, and the inconsistency of the respite services themselves.

This paper aims to explore the relationship between the use of respite services provided by the National Family Caregiver Support Program (NFCSP) and caregiver experiences. As the United States' 65 and older population continues to grow by about 2.3% each year, the need for caregivers will continue to grow¹. Because respite care is one of the most commonly requested services by caregivers², it is important to understand the impact and effectiveness of these services. Using the 2011-2013 results of the National Survey of Older Americans Act Participants, three logistic regressions will be used to identify the relationship between NFCSP respite services, and perceived time caregivers have for personal activities, the ease of caregiving, and level of caregiver stress.

BACKGROUND

Caregiver Burden

In 2013, there were an estimated 40 million family caregivers in the United States³. These caregivers provided an estimated 37 billion hours of care in various care recipient scenarios such as cancer, dementia, heart failure, transitions in care, and stroke⁴. Caregivers not only perform tasks such as bathing, shopping, and managing finances, but often perform medical and nursing tasks such as wound care and medication management⁵. The stress of caring for these types of recipients have, in many instances, led to negative health effects and financial burdens for the caregiver⁶.

The term “caregiver burden” is often identified in literature as the “overwhelming responsibility of caregivers”⁷. In “Home Alone: Family Caregivers Providing Complex Chronic Care”, researchers Reinhard, Levine, and Samis found that the more medical and nursing tasks a

1 Divison of Population Health. Caregiving. December 7, 2010. <http://www.cdc.gov/aging/caregiving/>.

2 Reinhard, Susan C. , Lynn Friss Feinberg, Rita Choula, and Ari Houser. Valuing the Invaluable: 2015 Update. Washington, D.C.: AARP Public Policy Institute, 2015.

3 Ibid.

4 Ibid.

5 Reinhard, Susan C., Carol Levine, and Sarah Samis . Home Alone: Family Caregivers Providing Complex Chronic Care. Washington, D.C.: AARP Public Policy Institute, 2012.

6 Collins, Lauren G., and Kristine Swartz. “Caregiver Care.” *American Family Physician* 83, no. 11 (2011): 1309-1317.

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caregiver performed, the higher the caregiver's levels of depression and anxiety, including feeling the need to constantly watch out for something to go wrong, feeling stress about talking to medical professionals, and feeling worried about making a mistake⁸. In addition, Cangelosi found that caregivers report higher rates of heart disease, arthritis, and diabetes, and that depression, sleep disorders, and even death have been linked with the strain of caregiving⁹.

Respite Care

Respite care is meant to address one of the most important needs of a caregiver: temporary relief¹⁰. The Older American Act defines respite care as time when caregivers can be "temporarily relieved from their caregiving responsibilities."¹¹ van Exel, de Graaf and Brouwer observed three types of caregivers: those who needed respite care and asked for it, those who needed respite care and did not ask for it, and those who did not need respite care¹². The caregivers who needed respite care experienced caregiver burden. Cangelosi notes, however, that caregivers often do not seek respite care until they are physically or emotionally depleted¹³.

Several studies have addressed factors influencing respite care use. Brown, Freidmann, and Mauro, for example, found that even though half of a low-income population perceived the need for adult daycare (a type of respite care service), only 19.1% used the service¹⁴. The use was mostly when care recipients had severe cognitive impairment¹⁵.

- 8 Reinhard, Susan C., Carol Levine, and Sarah Samis . Home Alone: Family Caregivers Providing Complex Chronic Care. Washington, D.C.: AARP Public Policy Institute, 2012.
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- 14 Brown, Ellen L., Marie-Luise Friedemann, and Ana C. Mauro. "Use of Adult Day Care Service Centers in an Ethnically Diverse Sample of Older Adults." *Journal of Applied Gerontology* 33, no. 2 (2014): 189-206.
- 15 Ibid.

Some researchers attribute nonuse of respite care to caregiver related factors. Casado, for example, found that sense of need for respite care and financial support were related to race and ethnicity, relationship with care recipient, financial status, availability of substitute help, family agreement, caregiving hours, interpersonal burden, and personal burden¹⁶. van Exel, de Graaf, and Brouwer attributed attitudes towards respite care to the caregiver's education level, employment status, health and happiness, gender of recipient, duration and intensity of caregiving, relationship, co-residence, need for surveillance, and subjective burden¹⁷. Dal Santo, Scharlach, Nielson, and Fox similarly found that caregivers who use respite care had more demanding care situations than those who did not use the services¹⁸.

In contrast, Menise and Steffen found that relationship type, household income, behavioral dysfunction functional impairment, and caregiver depression were not associated with respite care use¹⁹. In the use of in-home respite care through NFCSP, they found that a major predictor of respite care use among caregivers was previous use²⁰. This is consistent with the findings of Phillipson and Jones who found that caregivers for people with dementia who used day centers for respite care held a more positive view of day centers than nonusers who perceived negative outcomes for care recipients²¹.

Several researchers have found intrapersonal conflict as a reason why caregivers do not seek respite care. According to Cangelosi, caregivers do not seek respite care because they feel loss of control, sadness, sense of failure, and guilt if respite care is needed²². One study found that spouses

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often felt guilt about leaving spouses with residential respite care, and without continuous communication and updates, caregivers did not make use of the respite care²³. Another study found that caregivers were torn between the need for a break and their anxieties about the impact of in-hospital respite care on a person with dementia²⁴.

Finally, Cangelosi found that conflicting reports on the effects of respite care has also deterred some caregivers from using respite care services²⁵. On the one hand there are some studies that have found that respite care is useful^{26,27,28} but on the other hand, there is no consensus among studies that respite care significantly benefits caregivers and care recipients.^{29,30}

Two reviews of research on respite care found inconclusive results of the benefits on caregivers and care recipients. Maayan, Soares-Weiser, and Lee reviewed four studies on respite care for people with dementia³¹. Their review found that there was no evidence of any benefit of respite care for people with dementia or their caregivers for any outcome such as rates of institutionalization and caregiver burden. These researchers noted, however, that there were many methodological problems with the trials they reviewed including that the trials were small and had short durations. They concluded that more research is needed to understand

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the effects of respite care. Mason, et. al also concluded that more “better-quality up-to-date” evidence is needed, attributing their urgent call to the increasingly aging population³². Their 22-study review of the effectiveness and cost-effectiveness of different models of community based respite care, found that effects of all types of respite on caregivers were generally small but positive. They also found that many studies reported high levels of caregiver satisfaction and found no evidence that respite care delays residential care or negatively affects older adults.

National Family Caregiver Support Program

The main sources of publicly funded respite care are Medicaid, state-funded services, and the National Family Caregiver Support Program (NFCSP), which is administered by the Administration on Aging³³. This study will focus on NFCSP, the first federally funded program to formally recognize caregivers³⁴.

Established in 2000 by the Older Americans Act, this program provides grants to states and territories to fund support services for family and informal caregivers, so that they may keep their loved ones at home for as long as possible³⁵. In order to be eligible for NFCSP services, family or informal caregivers must be an adult providing care for an individual at least 60 years of age or individual of any age with Alzheimer’s, or an adult (nonparent) 55+ caring for children under 18 or adults with disabilities³⁶. The services these recipients receive vary from state to state.

Several studies have explored the variations in state programs and implementation. Feinberg and Newman found in case studies conducted on 10 states (Alabama, California, Florida, Hawaii, Indiana, Iowa, Maine, Pennsylvania, Texas and Washington) that states varied greatly in program design and integration of caregiver support into their home and community based care system³⁷. A few years later, these researchers

32 Mason, Anne, et al. “The Effectiveness and Cost-Effectiveness of Respite for Caregivers of Frail Older People.” *Progress in Geriatrics* 55, no. 2 (2007): 290-299.

33 Houser, Ari, and Kathleen Ujvari . *The State of Measurement of Respite Care*. Washington, D.C. : AARP Public Policy Institute, 2012.

34 Collins, Lauren G., and Kristine Swartz. “Caregiver Care.” *American Family Physician* 83, no. 11 (2011): 1309-1317.

35 U.S. Administration on Aging. *National Family Caregiver Support Program* . n.d. http://www.aoa.acl.gov/AoA_Programs/HCLTC/Caregiver/.

36 Houser, Ari, and Kathleen Ujvari . *The State of Measurement of Respite Care*. Washington, D.C. : AARP Public Policy Institute, 2012.

37 Feinberg, Lyn Friss, and Sandra L. Newman. “Preliminary Experiences of the

examined a nationwide survey of all 50 states and DC since the passage of NFCSP³⁸. They observed severe unevenness in services and service options provided within the states. They also found inconsistencies with eligibility and assessment, service and access, consumer direction, and system development.

Prior to NFCSP, 18 states and DC did not have a state program that supported family or informal caregivers, funded primarily through state general funds. Of the 32 states that had these programs prior to NFCSP, the service components only indirectly helped family caregivers³⁹. This could explain some of the variation in state programs. According to another study, having caregiver support programs funded prior to NFCSP is linked to successful implementation in delivering counseling, support group and training services⁴⁰.

METHODS

Data Source

The pooled cross-sectional data used for this study comes from the National Survey of Older Americans Act Participants from 2011 to 2013. In the first stage, surveyors selected a random sample of Area Agencies on Aging (AAA), and in the second stage, a random sample of clients for each sampled AAA was selected. Phone interviews of this sample were then conducted. The survey covers six services: Home Delivered Meals, Homemaker Services, Transportation, the Family Caregiver Support Program, Congregate Meals, and Case Management. However, this study will only focus on the Family Caregiver Support Program. The sample size for this study is about 4,800 and consists of individuals who have participated in their state's Family Caregiver Support Program.

One major limitation to using the data provided by the National Survey of Older Americans Act Participants is that despite variations in each state's Family Caregivers Support Program, this survey does not collect data on which states respondents are from. These variations in services, and potentially variation in quality could impact the outcome variables but cannot be controlled.

States in Implementing the National Family Caregiver Support Program." *Journal of Aging & Social Policy* 18, no. 3-4 (2006): 95-113.

38 Ibid.

39 Ibid.

40 Giunta, Nancy. "The National Family Caregiver Support Program: A Multivariate Examination of State-Level Implementation." *Journal of Aging & Social Policy* 22, no. 3 (2010): 249-266.

Variables

TABLE 1. DESCRIPTIVE STATISTICS

	Variable	Mean	Std. Dev.	Min	Max
Outcome Variables	More Time	0.66068	0.473519	0	1
	Easier	0.846833	0.36018	0	1
	Stress	0.754756	0.430269	0	1
Independent Variables	Respite	0.599246	0.490093	0	1
	Care Index	44.10107	14.2681	8	60
	Other Services	0.806512	0.395066	0	1
	Income	0.244736	0.42997	0	1
	# Caring for	0.348182	0.881093	0	8
	Left Alone	0.18343	0.387052	0	1
	Caregiver Disability	0.444559	0.496959	0	1
	Year	2012.038	0.818764	2011	2013

This study will analyze three outcome variables to estimate the impact of respite care on caregivers. Each outcome variable is a dichotomous variable (“yes” =1, “no” =0). The first outcome variable “More Time” answers the survey question: “As a result of the caregiver services you have received, do you have more time for personal activities?” As seen in table 1, 66% of respondents answered “yes”. The second outcome variable “Easier”, answers the question: “As a result of the caregiver services you have received, do you find it easier to care for the care recipient?” About 85% of respondents answered “yes”. The third and final outcome variable “Stress”, answers “As a result of the caregiver services you have received, do you feel less stress?” About three-fourths of caregivers answered “yes”. These variables were chosen as the outcome variables because, of the data collected, they best address caregiver burden.

Because caregivers could be referring to other services provided by the NFCSP in their responses to these three outcome variables, such as counseling and training services, and access assistance services, this study created a variable called “Other Services”, in addition to including a respite variable. Respite = 1 if the participant received respite care through the Family Caregiver Support Program. The “Other Services” variable was created by combining the responses of caregivers who stated that they have received training or education (including counseling or support groups),

received help or information from an AAA staff person, and have been provided other supplemental services. About 80% of caregivers fall into this category, while only 59.9% answered that they have received FCSP respite care. Some of these respondents overlap, but some have received one or the other. Respite is the treatment of interest, and “Other Services” will be used as a control.

The survey included several indicators of time spent on caregiving, including but not limited to hours of care on the weekend, hours of care on a weekday, and hours of care per week. This study uses an index that combines the responses to create the variable “Care Index” which ranges from 8 to 60, and has a mean of approximately 44. This variable will also be used as a control for the amount of time spent caregiving, because the amount of time a caregiver spends caregiving could potentially affect how they perceive the usefulness of NFCSP⁴¹.

The income variable is a dichotomous variable which identifies if the caregiver had a total combined household income of under \$20,000. Though the survey did include income as an ordinal variable as well, the brackets were not consistent, and therefore the results of the variable would be harder to interpret. About 24.4% of respondents indicated a household income of under \$20,000.

Other variables used as controls in this model include number of care recipients the caregiver cares for (mean= 0.348), whether or not the recipient can be left alone (18.34%), if the caregiver has a disability that is affected by caregiving (44.5%), and the year their responses were collected.

Design

This study tests three hypotheses:

1. Respite services provided by NFCSP impacts the likelihood that a caregiver responds that as a result of the caregiver services, they have more time for personal activities.
2. Respite services provided by NFCSP impacts the likelihood that a caregiver responds that as a result of the caregiver services, they find it easier to care for the care recipient.
3. Respite services provided by NFCSP impacts the likelihood that a caregiver responds that as a result of the caregiver services, they feel less stress.

This study will use a nonexperimental design and use logistic

41 Casado, Bangwa Lee. “Sense of Need for Financial Support and Respite Services among Informal Caregivers of Older Americans.” *Journal of Human Behavior in the Social Environment* 18, no. 3 (2008): 269-287.

regressions in order to estimate odds ratios. These odds ratios should identify the relationship between respite care, ease of care, time for personal activities, and stress, holding constant other variables in the model. Because this model is nonlinear, maximum likelihood will be used rather than OLS. A low mean VIF of 1.20 indicates that any collinearity present is not severe enough to cause a problem for this analysis.

Given the time and data limitations, this design was the best option to test Family Caregiver Support Program respite services. Because the National Survey of Older Americans Act Participants is funded by Title III of the Older Americans Act (Administration on Aging n.d.), there is likely a more consistent survey across the years. As mentioned previously in this paper, there are inconsistencies across various Family Caregiver Support Programs, so studying one state’s respite services would limit the generalizability of the study. However, inconsistencies among states also make studying respite services across states without focusing on a specific funding source problematic.

RESULTS

In all three models, respite care had an impact (more than double) on the caregiver experience outcome variable (time for personal activities, ease of caregiving and stress) at a .05 significance level, controlling for other variables in the model.

Time for Personal Activities

TABLE 2. RESULTS OF LOGISTIC REGRESSION FOR TIME FOR PERSONAL ACTIVITIES OUTCOME

Number of Observations= 4,854				
	Odds Ratio	Std. Err.	Z	P> z
Respite**	4.983672	0.3808633	21.02	0.000
Care Index**	0.978749	0.0028524	-7.33	0.000
Other Services**	1.458956	0.1342494	4.10	0.000
Income**	0.7399862	0.0553877	-4.02	0.000
# Caring for	0.9934425	0.0372267	-0.18	0.861
Left Alone	1.192052	0.130247	1.61	0.108
Caregiver Disability**	0.7833417	0.0514133	-3.72	0.000
Year	0.9501574	0.0376337	-1.29	0.194

**Significant at a .05 level

The odds ratio for respite care in table 2 is about 4.98 (~5). This tells us that the odds of responding “yes” to “as a result of caregiver services, do you have more time for personal activities?” with respite care use are about 5 times greater than without respite care, holding the control variables constant. By contrast, the odds of answering yes to the time for personal activities questions after using the other services are about 45% greater than without, holding the control variables constant. This result is also statistically significant. Care index, income and caregiver disability also yield statistically significant results; however, they indicate a lower likelihood of answering yes.

Ease of Caregiving

TABLE 3. RESULTS OF LOGISTIC REGRESSION FOR EASE OF CAREGIVING OUTCOME

Number of Observations= 4,841				
	Odds Ratio	Std. Err.	Z	P> z
Respite**	2.435566	0.2337167	9.28	0.000
Care Index**	0.9759377	0.0036841	-6.45	0.000
Other Services**	1.70876	0.1935546	4.73	0.000
Income	0.9897311	0.0933538	-0.11	0.913
# Caring for	0.9862116	0.0471912	-0.29	0.772
Left Alone	1.107439	0.1628168	0.69	0.488
Caregiver Disability**	0.7511704	0.0615944	-3.49	0.000
Year	0.9754239	0.0484675	-0.50	0.617

**Significant at a .05 level

The odds ratio for respite care in table 3 is about 2.44 (~2). This tells us that the odds of responding “yes” to “as a result of caregiver services, do you find it easier to care for the care recipient?” with respite care use are about twice as high as without respite care, holding the control variables constant. By contrast, the odds of answering yes to the ease of caregiving question after using the other services are about 71% greater (1.7: 1) than without, holding all other variables constant. This result is also statistically significant. Care index and caregiver disability also yield statistically significant results; however, they indicate a lower likelihood of answering yes.

TABLE 4. RESULTS OF LOGISTIC REGRESSION FOR STRESS OUTCOME

Number of Observations= 4,855				
	Odds Ratio	Std. Err.	z	P> z
Respite**	2.353295	0.1852128	10.87	0.000
Care Index**	0.9839709	0.0030254	-5.26	0.000
Other Services	1.169466	0.1149523	1.59	0.111
Income**	0.7741791	0.0603884	-3.28	0.001
# Caring for	0.919381	0.0352013	-2.20	0.028
Left Alone*	1.256511	0.1493586	1.92	0.055
Caregiver Disability**	0.790026	0.54689	-3.40	0.001
Year	0.9411118	0.0394347	-1.45	0.147

**Significant at a .05 level

*Significant at a .10 level

The odds ratio for respite care in table 4 is about 2.35 (~2). This tells us that the odds of responding “yes” to “as a result of caregiver services, do you feel less stress” with respite care use are about twice as high as without respite care, holding the control variables constant. Care index, income, and caregiver disability also yield statistically significant results; however, they indicate a lower likelihood of answering yes. In this model, other services do not yield statistically significant results. Left alone is statistically significant at a .10 level. The odds of answering yes to the time for the stress questions are about 26% greater for those whose care recipient can be left alone all day than for those that cannot be, holding all other variables constant.

CONCLUSION

Through the use of the National Survey of Older Americans Act Participants (2011-2013), which surveyed family caregivers who participated in their state’s Family Caregiver Support Program, these three logistic regressions found that there were significantly increased odds of participants answering that as a result of caregiver services, they had more time for personal activities, found it easier to care for care recipient, and felt less stress. This supports research that found favorable outcomes as a result of respite care for caregivers.

Although this study found that respite care led to positive and significant outcomes for caregivers, there are still mixed research results

surrounding the impact of respite care⁴²⁴³. These mixed results may be due to an inconsistency in the definition of respite care across programs and states⁴⁴ and the inconsistency of the respite services themselves⁴⁵⁴⁶.

In order to get a broad consensus on the effects of respite care, and potentially encourage caregivers to use the services as a result⁴⁷, more up-to-date, high quality research needs to be conducted. This recommendation has been made by nearly every source consulted for this study, including Maayan, Soares-Weise, and Lee and Mason et. al in their reviews of respite care studies⁴⁸⁴⁹. In addition, Reinhard, Feinberg, Choula, and Houser make recommendations to “develop a common definition and unit of measurement fore respite care (at the federal and state levels)”⁵⁰.

It is not likely that respite services funded by the NFCSP will standardize their programs across states, so a final recommendation to aid in furthering respite care research is to include a question about what state the caregiver is from in the National Survey of Older Americans Act Participants. With this added question, researchers can hold differences across states constant to gain more accurate estimates from their models.

Because of the rapidly aging United States population, it is unlikely that there will be a sufficient number of direct-care workers to replace

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- 42 Mason, Anne, et al. “The Effectiveness and Cost-Effectiveness of Respite for Caregivers of Frail Older People.” *Progress in Geriatrics* 55, no. 2 (2007): 290-299.
- 43 Maayan, Nicola, Karla Soares-Weise, and Helen Lee. *Respite care for people with dementia and their carers*. Oxford: The Cochrane Collaboration, 2014.
- 44 Houser, Ari, and Kathleen Ujvari . *The State of Measurement of Respite Care*. Washington, D.C. : AARP Public Policy Institute, 2012.
- 45 Feinberg, Lynn Friss, and Sandra L. Newman. “A Study of 10 States Since Passage of the National Family Caregiver Support Program: Policies, Perceptions, and Program Development.” *The Gerontologist* 44, no. 6 (2004): 760-769.
- 46 Feinberg, Lyn Friss, and Sandra L. Newman. “Preliminary Experiences of the States in Implementing the National Family Caregiver Support Program.” *Journal of Aging & Social Policy* 18, no. 3-4 (2006): 95-113.
- 47 Cangelosi, Pamela R. “Caregiver BURDEN or Caregiver GAIN? Respite for Family Caregivers.” *Journal of Psychosocial Nursing* 47, no. 9 (2009): 19-22.
- 48 Mason, Anne, et al. “The Effectiveness and Cost-Effectiveness of Respite for Caregivers of Frail Older People.” *Progress in Geriatrics* 55, no. 2 (2007): 290-299.
- 49 Maayan, Nicola, Karla Soares-Weise, and Helen Lee. *Respite care for people with dementia and their carers*. Oxford: The Cochrane Collaboration, 2014.
- 50 Reinhard, Susan C. , Lynn Friss Feinberg, Rita Choula, and Ari Houser. *Valuing the Invaluable: 2015 Update*. Washington, D.C.: AARP Public Policy Institute, 2015.

informal and family caregivers⁵¹. Respite care is meant to address the needs of temporary relief for caregivers, and is their most requested service⁵². Therefore, this is an issue that urgently needs more research and support.

51 Rose, Miriam S., Linda S. Noelker, and Jil Kagan. "Improving Policies for Caregiver Respite Services." *The Gerontologist* 55, no. 2 (2015): 302-308.

52 Reinhard, Susan C. , Lynn Friss Feinberg, Rita Choula, and Ari Houser. *Valuing the Invaluable: 2015 Update*. Washington, D.C.: AARP Public Policy Institute, 2015.

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SHOULD PUBLIC FUNDS BE USED FOR CHARTER SCHOOLS? DC AS A CASE STUDY

by Elizabeth Bersin & Katherine Kehres

ABSTRACT

The number of charter schools in the United States has been increasing rapidly since the first charter school was established in Minnesota in 1992. DC's first charter school was opened in 1995 and since then more parents, educators, and policy makers have argued that charter schools create a free market for education and improve student achievement. These publicly funded schools cannot accept every student, making it important to evaluate whether these claims are valid. Using DC public and charter school student achievement data from 2012-2014, the authors conducted an analysis on the performance of students on the Math and Reading DC-CAS assessment to study how the scores differ between public schools and charter schools. Initial results indicate that charter schools are associated with higher student achievement, however two major drawbacks are present in our design. Because of the drawbacks in our data source, our analysis is inconclusive as to whether or not charter schools represent a good investment.

INTRODUCTION

The presence of charter schools is one of the many changes that have occurred during the past 25 years in education policy. Charter schools have also been subject to numerous controversies and increased scrutiny by education leaders and the public alike.¹ Policy makers that support charter schools argue that in order to reform schools and districts there must be a competitive marketplace. Charter schools therefore provide a free market for education and choice.²

Between the 1991-1992 school year and the 2012-2013 school year, the percentage of public schools that were charters increased from 1.7% to 6.2%.^{3,4,5} In hard numbers, that was an increase from 1,500 to 6,100 schools.⁶ The key question being considered is whether or not charter schools offer a better education than traditional public schools. We plan to consider this question using student achievement outcomes at charter schools as compared to those at public schools. Since charter schools are publicly funded, it is important to consider the type of education they are providing. Do charter schools offer better programs that improve student achievement as compared to public schools by an amount significant enough to warrant public funding? Does attending a charter school actually decrease a student's performance? Does free market choice mean a better school system? To answer these questions, we will use data from the District of Columbia (DC) to analyze student performance on the Math and Reading DC-CAS assessment to study how the scores differ between public schools and charter schools.

HISTORY OF CHARTER SCHOOLS

Dr. Ray Budde of the University of Massachusetts first introduced the concept of the charter school in 1974 in a paper he published that described a system in which teachers could teach without having to answer to a district

1 "Charter Schools: Finding Out The Facts", accessed November 4, 2015, <http://www.centerforpubliceducation.org/Main-Menu/Organizing-a-school/Charter-schools-Finding-out-the-facts-At-a-glance/Charter-schools-Finding-out-the-facts.html>

2 Danny Weil, Charter school movement: History, politics, policies, economics and effectiveness (Grey House Pub, 2009)

3 "Fast Facts", accessed November 27, 2015, <https://nces.ed.gov/fastfacts/display.asp?id=30>

4 We are not under the impression that these are replacing traditional schools, though this was specifically clarified.

5 While we were not able to determine how the number of total students affected, charter schools with smaller enrollments (under 300 students) decreased from 77 to 54 percent, while charter schools with larger enrollment (500+ students) increase from 11 to 22 percent (Fast Facts).

6 "Fast Facts"

bureaucracy.⁷⁸ The idea gained traction through the 1980s as a response to calls for school reform and eventually captured the interest of the American Federation of Teachers and the Department of Education. In 1988, Budde's idea was referenced (and promoted) by then-president of the Federation, Albert Shanker, in his weekly New York Times column.⁹ In a speech later that year to the National Press Club, Shanker¹⁰ proposed a form of these "charter schools", a name taken from Budde's original work. His vision was a new school within a school that was teacher-formed, and gave parents and teachers the ability to "opt for" a different type of school. In 1992, the first charter school was opened in Minnesota just one year after it became the first state to pass charter school legislation.¹¹

The concept of charter schools was introduced in the District of Columbia in 1995. The DC School Reform Act of 1995 authorized¹² the creation of public charter schools under the control of the DC Board of Education (DC BoE), the only agency that could authorize charter schools in the District.¹³ A key aspect of the law requires identical operating funding for both DC Public Schools (DCPS) and public charter schools on a per student basis.¹⁴ The law also specifies an allowance of 20 charters every year and has no appeals process regarding charter authorizations. DC charter schools are also waived from state education regulations¹⁵ and laws and operate on 15-year contracts that are performance-based, requiring a review every five years at a minimum.¹⁶ In 1996, the Act was amended to add the Public Charter School Board as another independent agency that could authorize charter schools. That same year, the first charter school in the District opened to 160 students.¹⁷

In 2006, the DC BoE voted to give up their charter school responsibilities,

7 This paper was essentially an outline for a book he tentatively titled *Education by Charter: Key to a New Model of School District*. (Karanovich, 2009).

8 Frances Karanovich, "The Evolution Of Charter Schools: From Concept To Public Schools Of Choice", *Journal Of Philosophy And History Of Education* 59: 203-208

9 Karanovich, "The Evolution of Charter Schools"

10 Incidentally, Shanker and his colleagues withdrew their support for the charter school system a few years later. One of their concerns had to do with the use of vouchers (Karanovich, 2009).

11 Karanovich, "The Evolution of Charter Schools"

12 Congress passed this act.

13 "Charter Facts", accessed November 4, 2015, <http://www.focusdc.org/charter-facts>

14 "Charter Facts"

15 This does not include testing, but rather items such as school policies and programs, classroom sizes, and curriculum adjustments (National Alliance for Public Charter Schools).

16 Danny Weil, *Charter school movement: History, politics, policies, economics and effectiveness* (Grey House Pub, 2009)

17 "Charter Facts"

meaning that the Public Charter School Board (PCSB) would be the only agency to authorize charter schools for the District.¹⁸ The DC Council passed legislation the following year to give direct authority over DC Public Charter Schools (DCPCS) to the Office of the Mayor.¹⁹ According to the Friends of Choice in Urban Schools (FOCUS) nonprofit, DCPCS enrollment is almost 39,000 students at over 100 schools, making up about 44% of public school children in the District.^{20,21}

It is important to note that charter schools are not private schools, nor alternative schools – they are publicly accountable public schools that exist under a contract. Thus, charter schools are also held accountable to the same educational standards put in place by their state, district, and federal education statutes.²²

FINANCING CHARTER SCHOOLS

Similar to public schools, charter schools receive funding from both the district and the state according to enrollment (specifically, average daily attendance, or ADA).²³ Charter schools, also like public schools, are not allowed to charge students tuition.²⁴ The amount of funding charter schools receive varies by state and district. A school's funding is often negotiated and determined in their charter contract.²⁵ Nationwide, it is estimated on average that charter schools are funded at 64% of their public school counterparts.²⁶ Additional resources in the form of federal education grants are available for charter schools, and are either distributed by the U.S. Department of Education (using an application process) or are funneled through state agencies that are responsible for distributing funds.²⁷ Unlike public schools, a majority of charter schools are required to provide the capital to find and secure a location, and many charters schools have repurposed buildings (old schools, churches, etc.) to help defray those costs.²⁸

Funding in DC is based off the Uniform Per Student Funding Formula, which guarantees a base level of funding for both charter and public schools on

18 “Charter Facts”

19 “Charter Facts”

20 “Facts and Figures: Market Share”, accessed November 4, 2015, <http://www.dcpsb.org/facts-and-figures-market-share>

21 See figure 8 in Appendix 1 showing charter school market share, both over time and in recent years,

22 Weil, Charter School Movement

23 “Just the FAQs”, accessed November 4, 2015, <https://www.edreform.com/2012/03/just-the-faqs-charter-schools/>

24 Weil, Charter School Movement

25 “Just the FAQs”, November 4, 2015.

26 “Just the FAQs”

27 “Just the FAQs”

28 “Just the FAQs”

a per student basis.²⁹ This base was set at \$5,000 per student in 1998/1999 and is set to rise each year by either 4% or the local Consumer Price Index, whichever is lower.³⁰ ³¹ The base funding level assumes a student is in grades 4 or 5 and does not receive any extra services from the school – additional funding is provided for students in lower and higher grades, and those receiving special services.³²³³ The total local contribution for both public and charter schools is determined by multiplying the number of students in each category (taken from the fall enrollment count) by the Weighted Pupil Unit factor, and then again by the base level.³⁴ District public schools are also eligible for other funding that charter schools are not, including: intra-district funds, capital construction funds, and federally funded retirement programs.³⁵

The District of Columbia’s Office of Public Charter School Financing and Support (OPCSFS) was created in 2003 in order to manage several financing programs specifically for public charter schools.³⁶ This agency supports innovation and best practices for all public schools (charter and traditional), as well as improves the number of public charter school seats and quality of the schools.³⁷ OPCSFS manages the DC Charter Schools Program grant given by the US Department of Education, a grant specifically meant to fund the creation and implementation of new public charter schools.³⁸ DC is also one of the few states/municipalities to offer funding for facilities to charter schools, though it is still less than public schools receive.³⁹

One issue that can arise with financing public charter schools and which has been especially present in the DC system is the funding cycle. Charter schools initially receive money based on projected enrollment taken from attendance records in April and are given the public rate until enrollment audits are completed. These, however, are not usually complete until January or February, giving dishonest operators plenty of room for fraudulent practices and causing

29 Larry Maloney, “Charter School Funding: Inequity Persists”, Washington, DC: Ball State University 2015

30 Maloney, “Charter School Funding”

31 The base level for FY 2006-2007 was \$8,002 (Maloney).

32 Maloney, “Charter School Funding”

33 This includes services such as special education, Title I, and free or reduced lunches, among others.

34 Maloney, “Charter School Funding”

35 Maloney, “Charter School Funding”

36 Maloney, “Charter School Funding”

37 “Funding Opportunities For The DC Public Charter Schools”, accessed November 4, <http://osse.dc.gov/service/funding-opportunities-dc-public-charter-schools>

38 “Funding Opportunities”

39 Maloney, “Charter School Funding”

many problems.^{40 41}

SPECTRUMS OF RESEARCH

Eric Bettinger examined the effect of charter schools on charter students and public schools using school-level data from Michigan's standardized testing results.⁴² He used a difference-in-differences estimator to compare (successive) groups of fourth grade classes and used a lagged dependent variable specification to check this and ensure entering students with low scores do not cause an overstatement of the effect. This estimator compares the fourth grade charter school students with public school fourth graders who have similar "pre-charter" test scores.⁴³ Using this analysis method, Bettinger found no evidence that charter schools improve test scores more quickly than public schools with similar "pre-charter" test scores. His estimates even suggest that charter school fourth graders may actually score lower on reading and math exams than public school fourth graders.⁴⁴ He suggests that a long-term study in the future would be useful to further examine the data and results⁴⁵ (However, these results may not be generalizable to major urban areas).

Marcus Winters examined the effect of charter schools on public school student achievement specifically in New York City, which may provide a better comparison to DC. Winters used student-level data on Math and English Language Arts scores from the New York City Department of Education.⁴⁶ These tests are administered to students in grades 3 through 8, and the author used data from 2006 through 2009. His results indicated that students in public schools had a small, but positive gain in achievement due to the competition from charter schools. Hispanic students were found to have a significant gain in achievement in Math, as compared to white students, due to this competition.⁴⁷ His research suggests that even if charter school achievement is not higher than public schools, the free market choice helps improve public schools in urban areas.

These two studies show how wide and varied the spectrum of previous research regarding student achievement in charter schools can be. Each study finds different rates of success or failure, more or less significance, and concludes

40 It is unclear what happens to this money due to a highly unregulated system (regardless of laws)

41 Weil, Charter School Movement

42 Eric P. Bettinger, "The effect of charter schools on charter students and public schools." *Economics of Education Review* 24, no. 2 (2005)

43 Bettinger, "The effect of charter schools," 133-147

44 Bettinger, "The effect of charter schools," 133-147

45 Bettinger, "The effect of charter schools," 133-147

46 Marcus A. Winters, "Measuring the effect of charter schools on public school student achievement in an urban environment: Evidence from New York City," *Economics of Education review* 31, no. 2 (2012): 293-301

47 Winters, "Measuring the effect of charter schools"

with different recommendations. It seems that, based on these findings, studies must be done regarding the specific population that is intended to benefit from the inclusion (or exclusion) of charter schools.

DATA

We are interested in analyzing whether the public funds being given to charter schools are being put to good use based on student achievement. Though they receive less funding than public schools, this can, in part, be attributed to the populations they serve (i.e. fewer students with needs for special services). In order to study the impact of charter schools on test scores for students, we are using DC-CAS data from three school years, 2012, 2013, and 2014. The DC-CAS assessment is administered in the spring for students in grades 2-10.⁴⁸ These tests were aligned specifically with DC English/Language Arts, Math, Science, and Health Standards.⁴⁹ Students in grades 2-10 have been taking Math and English Language Arts tests since 2006 and tests for Science (grades 5-8) and Biology have been in place since 2007.⁵⁰ There is a composition component to the test that has been in place since 2008, but in 2012 this component was aligned with the Common Core standards.⁵¹ The Health and Physical Education Assessment began in 2012 for grades 5 and 8.⁵²

We only found data for Math and Reading. In 2014, the data that was available indicated the number of students who took the assessment per school, and the number of students who scored at each level of the test, below basic, basic, proficient, and advanced. In 2012 and 2013, the available data indicated the number of students who took the test at each school, and the number of students who scored at the proficient and the advanced level. For all school years, the authors created a percentage with the number of students who scored at the proficient and the advanced level over the number of students who took the test at each school. This was used as the outcome variable. The key explanatory variable in our analysis was a dummy variable indicating whether or not a school was a charter school. Charter schools and public schools were differentiated through the district number listed, as shown in the District column in the 2012 and 2013 data. While all DCPS schools are part of the same district, each charter school is considered its own district. The 2012 and 2013 data were matched to the 2014 data using the school code as a unique identifier for each school to determine the correct district. One school had to be looked up online by the authors to determine the type of school.

In D.C., there is a large difference in neighborhood schools. Children living in Ward 3 (a more wealthy area) will likely have a very different experience

48 “DC-CAS”, accessed November 20, 2015, <http://osse.dc.gov/service/dc-cas>

49 “DC-CAS”

50 “DC-CAS”

51 “DC-CAS”

52 “DC-CAS”

in DCPS schools than children living in Ward 8 (a poorer area with a large African American population). We included a vector of Ward fixed effects as additional controls. We only have school level data so we are unable to identify which Ward the students originate from, but we believe it is likely that students will attend a charter school closer to home (and likely in their Ward) because it is convenient and they are more likely to have other friends attending the school. For those who live close to the border of their Ward, this may not be the case. Figure 1 below presents a few key demographic characteristics for each Ward.⁵³

FIGURE 1⁵⁴

Key Demographic Characteristics for Each D.C. Ward			
Ward	Percent of Population that is Black ¹	Median Household Income	Percent of Families Below the Poverty Line ²
Ward 1	45.74%	\$36,902	19.7%
Ward 2	19.93%	\$44,742	11.6%
Ward 3	5.78%	\$71,875	2.7%
Ward 4	70.73%	\$46,408	7.9%
Ward 5	86.65%	\$34,433	14.3%
Ward 6	62.73%	\$41,554	19.1%
Ward 7	96.84%	\$30,533	21.6%
Ward 8	92.41%	\$25,017	33.1%

The Ward breakdowns were only available in the 2012 and 2013 data. Using the unique school code, the authors determined the correct Ward for the 2014 data. There were some schools that were in the 2014 data that were not in the 2012 or 2013 data. For those schools, the authors searched the Internet for the school to determine its address, and used the address to determine which Ward it was in. There were 18 records that needed to be looked up by the authors.

Figures 2, 3 and 4 below show the descriptive statistics for the percent of students who scored at or above the proficient or advanced level for math and reading. One key factor to point out is that there are many more observations for Wards 1, 4, 5, 6, 7 and 8 than there are for Wards 2 and 3 because there are fewer schools in those areas.⁵⁵ There are also major differences in the range of scores for each Ward as well as differences in the means.

FIGURE 2

Data Overview By Ward: Percent of Students Scoring at the Proficient or Advanced Level in Math					
Ward Number	Num. of Observations	Mean	Standard Deviation	Min	Max
Ward 1	53	52.68%	23.12%	5.17%	100%
Ward 2	26	69.27%	18.72%	23.38%	98.23%
Ward 3	30	82.26%	9.71%	59.52%	93.68%

53

This data is from 2002, and the demographic characteristics have likely changed somewhat in the 10 years between this information was gathered and the first year of the DC-CAS assessment data.

54 “DC Open Data”

55 See Appendix 2

Ward 4	90	52.93%	18.39%	0%	95%
Ward 5	85	47.57%	22.44%	7.5%	100%
Ward 6	74	47.66%	18.6%	6.72%	80.73%
Ward 7	95	41.85%	20.27%	4.84%	91.57%
Ward 8	103	37.96%	21.47%	8.33%	95.37%

FIGURE 3

Ward Number	Num. of Charter School Observations	Num. of DCPS School Observations	Total School Observations	Percent of Charter Schools	Percent of DCPS Schools
Ward 1	21	32	53	39.62%	60.38%
Ward 2	3	24	27	11.11%	88.89%
Ward 3	0	30	30	0%	100%
Ward 4	49	44	93	52.69%	47.31%
Ward 5	45	41	86	52.33%	47.67%
Ward 6	25	50	75	33.33%	66.67%
Ward 7	44	53	97	45.36%	54.64%
Ward 8	45	59	104	43.27%	56.73%

FIGURE 4

Ward Number	Num. of Observations	Mean	Standard Deviation	Min	Max
Ward 1	53	47.76%	20.41%	3.33%	97.73%
Ward 2	26	68.78%	19.72%	24.68%	99.33%
Ward 3	30	82.09%	9.42%	60.32%	94.19%
Ward 4	90	52.24%	18.89%	0%	95.24%
Ward 5	85	47.45%	20.31%	11.25%	100%
Ward 6	74	45.64%	17.72%	5.22%	77.78%
Ward 7	95	37.74%	17.16%	10.14%	96.39%
Ward 8	103	33.49%	15.68%	8.33%	72.53%

Figure 3 presents the number of observations for Charter Schools per Ward. As this is over a three-year period, it does not reflect the number of schools exactly but will show approximately three observations per school. Ward 2 appears to just have one charter school and Ward 3 does not have any charter schools.

Figures 5 and 6 below show the difference in means for charter schools versus DCPS schools. Specifically in Wards 7 and 8, there is a major increase in students scoring at the proficient or advanced levels at the charter schools versus the DCPS schools. The percentage of students scoring at the proficient or advanced level in Ward 7 jumps from 32.15% at DCPS schools to 54.10% at charter schools. There is a similar increase for Ward 8 where only 25.88% of students at DCPS schools score at the proficient or advanced level but 54.17% of charter school students score in that range. These differences suggest that charter schools may have a significant impact at on test scores in areas with a high percentage of minorities and lower median incomes, thus in fact helping students in areas where it is most needed.

FIGURE 5

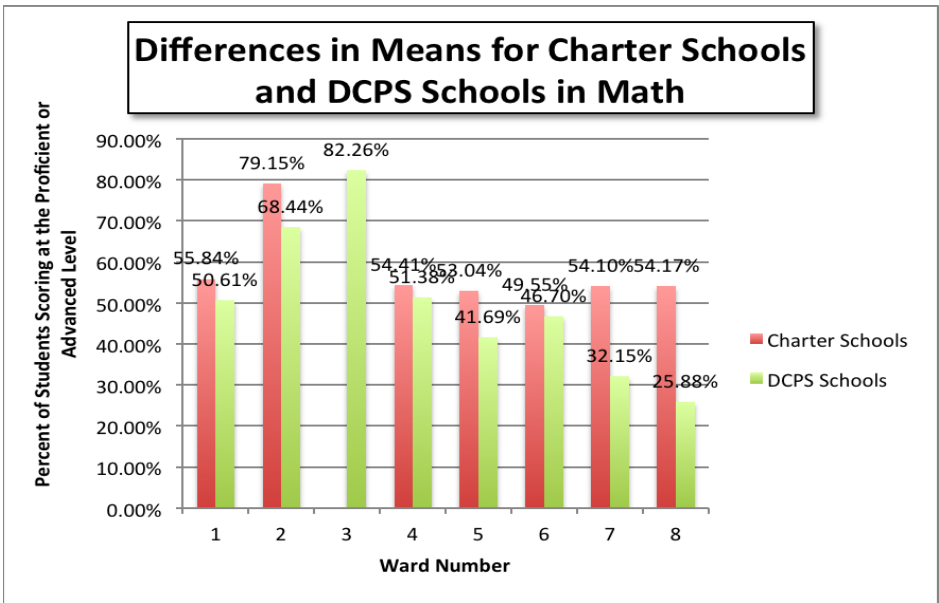
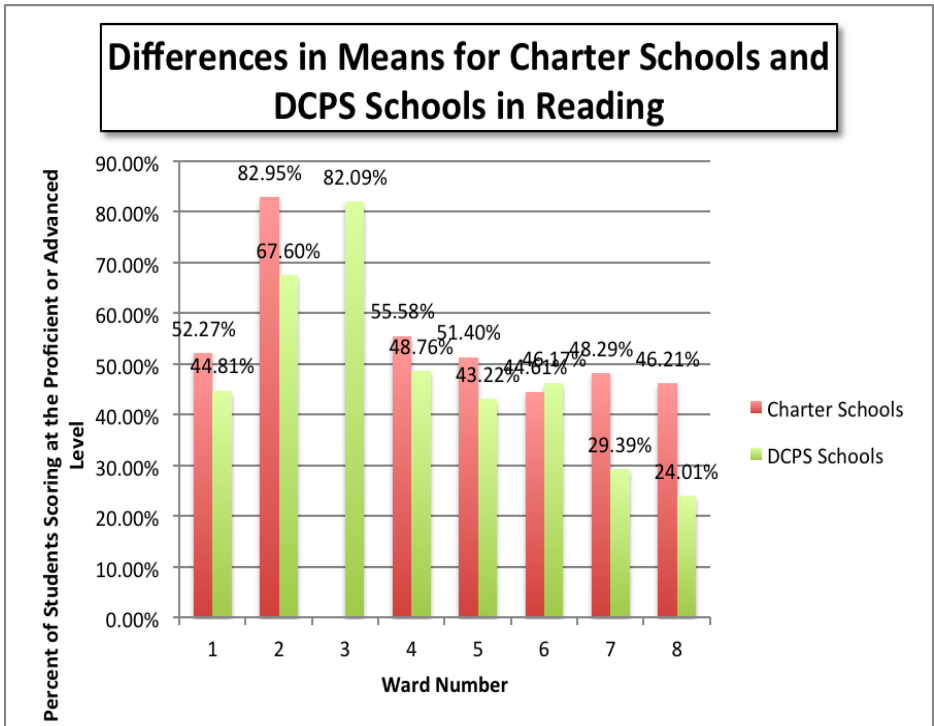


FIGURE 6



METHODOLOGY AND RESULTS

Our theoretical model for the relationship between whether or not a school is a charter school and the percent of students who scored at the proficient level in math and reading is as follows:

$$Y_{1i} = \alpha_1 + \beta_1 X_i + \delta_{11} Z_{i1} + \delta_{12} Z_{i2} + \delta_{13} Z_{i3} + \delta_{14} Z_{i4} + \delta_{15} Z_{i5} + \delta_{16} Z_{i6} + \delta_{17} Z_{i7} + \delta_{18} Z_{i8} + e$$

$$Y_{2i} = \alpha_1 + \beta_1 X_i + \delta_{11} Z_{i1} + \delta_{12} Z_{i2} + \delta_{13} Z_{i3} + \delta_{14} Z_{i4} + \delta_{15} Z_{i5} + \delta_{16} Z_{i6} + \delta_{17} Z_{i7} + \delta_{18} Z_{i8} + e$$

Where Y_{1i} is the percent of students in Math who scored at the proficient or advanced level, X_i is a dummy variable indicating that a school is a Charter school or not, each of the Z_i variables are Wards 1 – 8, and Y_{2i} is the percent of students in Reading who scored at the proficient or advanced level. We estimated our coefficients using OLS. We clustered on school and used robust standard errors.⁵⁶

FIGURE 7

Results for Charter Schools and Percent of Students Scoring at the Proficient or Advanced Level					
Math					
Variable	Coefficient	Standard Error	t value	Confidence Interval	
Charter School	.1353***	.0291	4.64	.0778	.1927
Ward 1	-.3493***	.0622	-5.61	-.4721	-.2266
Ward 2 ³	-.1403**	.0652	-2.15	-.2689	-.0117
Ward 3	Used as Base for Other Ward Number coefficients				
Ward 4	-.3624***	.0474	-7.64	-.456	-.2688
Ward 5	-.4169***	.053	-7.86	-.5214	-.3124
Ward 6	-.3916***	.0468	-8.37	-.4838	-.2994
Ward 7	-.4638***	.0397	-11.68	-.5421	-.3856
Ward 8	-.5007***	.0396	-12.65	-.5787	-.4227
Constant	.8226***	.0287	28.67	.7660	.8791
R ² = 0.3013 n = 556					
* = Significant at the .1 level ** = Significant at the .05 level *** = Significant at .01 level					
Variable	Coefficient	Standard Error	t value	Confidence Interval	
Charter School	.1156***	.0255	4.53	.0653	.1659
Ward 1	-.389***	.0562	-6.93	-.4998	-.2783
Ward 2 ⁴	-.142**	.0688	-2.06	-.2777	-.0063
Ward 3	Used as Base for Other Ward Number coefficients				
Ward 4	-.3575***	.0465	-7.68	-.4493	-.2658
Ward 5	-.4062***	.0501	-8.11	-.5049	-.3074
Ward 6	-.4035***	.0465	-8.69	-.4951	-.3119
Ward 7	-.4945***	.0371	-13.34	-.5676	-.4214
Ward 8	-.5353***	.0351	-15.26	-.6045	-.4662
Constant	.8209***	.0286	28.74	.7646	.8772
R ² = 0.3738 n = 556					
* = Significant at the .1 level ** = Significant at the .05 level *** = Significant at .01 level					

Our results indicate that attending a charter school is associated with a 13.5

⁵⁶ A specification without robust standard errors was used and the differences are fairly small.

percentage point increase in students who score at the proficient or advanced level in Math. For reading, attending a charter school is associated with an 11 percentage point increase in the percent of students who score at the proficient or advanced level. These coefficients are significant at the .01 level. These increases are practically significant as well as because it represents an increase in the pass rate of more than 1/10th of the students in the District. We also used a design where we did not include data from Wards 2 and 3 because there is not a good mix of charter schools and DCPS schools as compared to the other Wards, and our estimates did not change.⁵⁷

There are two major drawbacks to our data and our results. One issue is that in some cases (though not all), charter schools can select their students based on criteria such as test scores and are likely to choose students who have higher scores going in. Public schools must accept everyone. If the data was available, we could address this issue by only using Charter schools that accept students by lottery or by some other random method. The other main issue is that students who want to attend charter schools (and their parents) are likely different than students who attend public schools. This could be addressed with data at the student level that indicated scores for students who had attended a charter school versus students who were randomly excluded (like from a waiting list) from attending a charter school and had to attend a DCPS school.

CONCLUSION

Because of the drawbacks in our data source, our analysis is inconclusive in terms of indicating whether or not charter schools represent a good investment. Our results indicate that they do, but the fact that charter schools can choose students and that students who attend charter schools are different than those who attend DCPS schools means that it is likely omitted factors on ability, drive or others are impacting our results. Because these students are more likely to score higher on tests anyway, it is likely our coefficient has a positive bias that is inflating the influence of charter schools. A much better experiment would follow students that applied to a charter school and compared test scores on those that got in versus those that did not ideally when students were assigned by lottery.

Our results, were they to be more reliable, would imply that policy makers should encourage the expansion of the charter school system and work to provide more federal funding for charter schools. Expanding the charter school system would give children more equal access to charter schools, especially in low-income areas. This would include, but is not limited to, exploring the reason for lower rates of funding in charter schools as compared to public schools. If, however, this were to be taken on by policymakers, it would also be advisable that better regulations be put in place to avoid misuse of funds and to ensure that charter schools continue to provide an environment where students can become high achievers. These results would also potentially highlight that the curriculum,

57 See Appendix 3 for table of results.

teachers or another factor about charter schools are potentially more effective than public schools, so policymakers could encourage public schools to adopt techniques from charter schools and see if test scores improve. Ultimately, teasing out which of these impacts is causing the improvement on test scores would be extremely difficult, but further research would aim to do just that.

APPENDIX 1: CHARTER SCHOOL AND POVERTY GUIDELINE DATA

FIGURE 8: CHARTER SCHOOL MARKET SHARE GROWTH

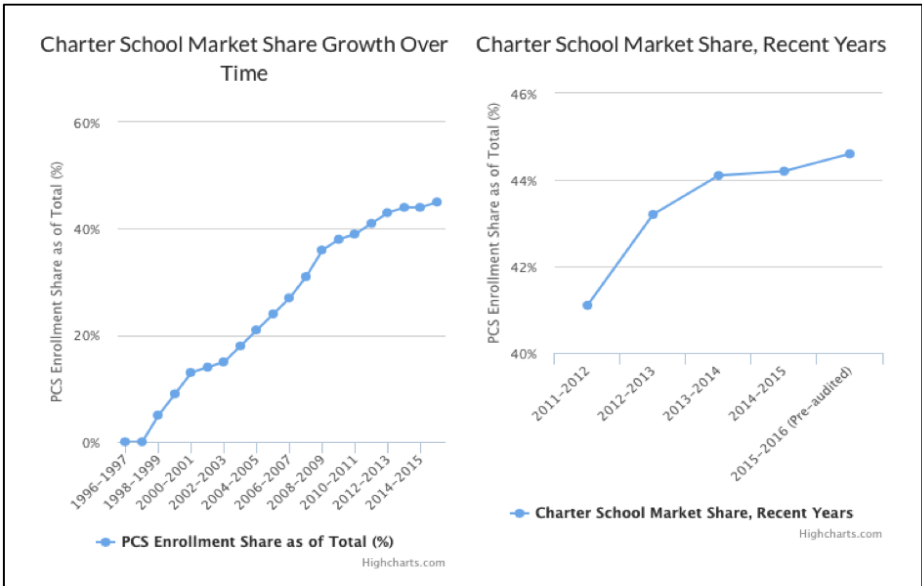


FIGURE 9: 2012 POVERTY GUIDELINES FOR U.S. CONTIGUOUS STATES AND D.C.

**2012 Poverty Guidelines for the
48 Contiguous States and the District of Columbia**

PERSONS IN FAMILY/HOUSEHOLD	POVERTY GUIDELINE
1	\$11,170
2	15,130
3	19,090
4	23,050
5	27,010
6	30,970
7	34,930
8	38,890

For families/households with more than 8 persons, add \$3,960 for each additional person.

FIGURE 10: 2013 POVERTY GUIDELINES FOR U.S. CONTIGUOUS STATES AND D.C

2013 POVERTY GUIDELINES FOR THE 48 CONTIGUOUS STATES AND THE DISTRICT OF COLUMBIA

PERSONS IN FAMILY/HOUSEHOLD	POVERTY GUIDELINE
1	\$11,490
2	15,510
3	19,530
4	23,550
5	27,570
6	31,590
7	35,610
8	39,630

For families/households with more than 8 persons, add \$4,020 for each additional person.

FIGURE 11: 2014 POVERTY GUIDELINES FOR U.S. CONTIGUOUS STATES AND D.C.

2014 POVERTY GUIDELINES FOR THE 48 CONTIGUOUS STATES AND THE DISTRICT OF COLUMBIA

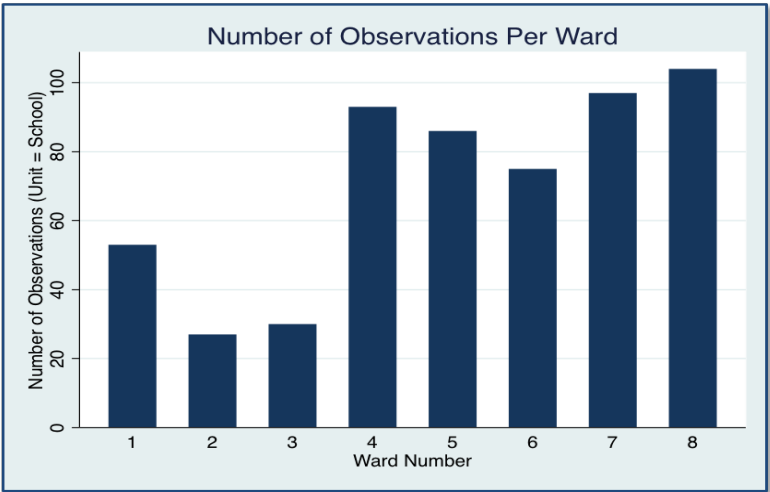
PERSONS IN FAMILY/HOUSEHOLD	POVERTY GUIDELINE
1	\$11,670
2	15,730
3	19,790
4	23,850
5	27,910
6	31,970
7	36,030
8	40,090

For families/households with more than 8 persons, add \$4,060 for each additional person.

There is a difference between poverty thresholds and poverty guidelines. The poverty threshold is used for statistical purposes such as the number of Americans in poverty every year. The poverty guidelines (included here) are a simplified version of the threshold used for administrative purposes, such as financial aid eligibility (Poverty Guidelines).

APPENDIX 2: OBSERVATIONS PER D.C. WARD

FIGURE 12: NUMBER OF OBSERVATIONS PER D.C. WARD



APPENDIX 3: BOX PLOTS FOR EACH WARD FOR MATH AND READING PERCENTAGES

FIGURE 13, BOX PLOT BY D.C. WARD FOR MATH SCORES

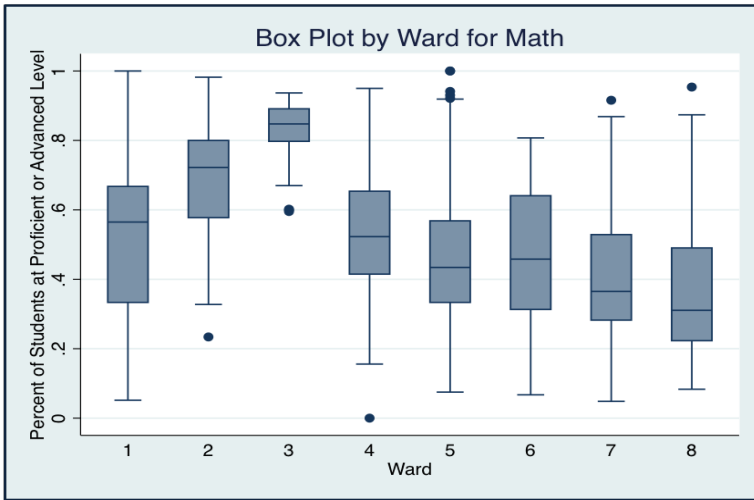
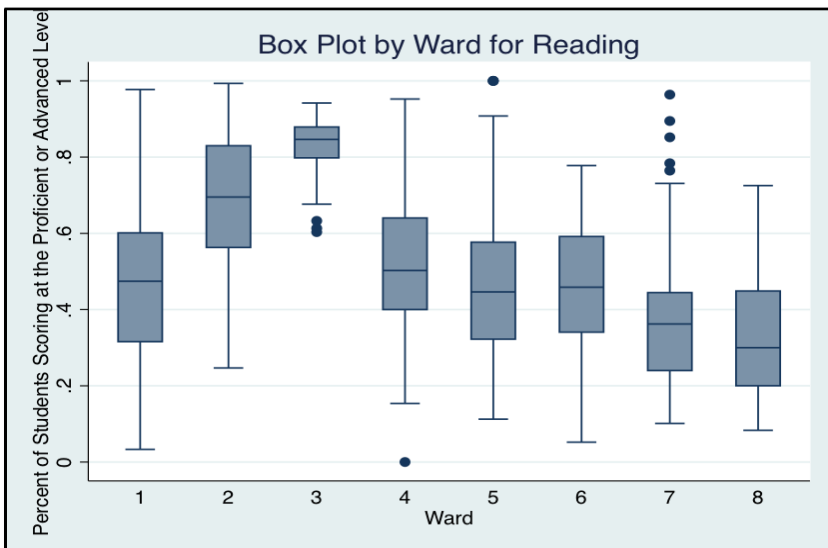


FIGURE 14, BOX PLOT BY D.C. WARD FOR READING SCORES



APPENDIX 4: TABLE OF RESULTS FOR SPECIFICATION THAT EXCLUDED WARDS 2 AND 3

FIGURE 15

Results for Charter Schools and Percent of Students Scoring at the Proficient or Advanced Level					
Math					
Variable	Coefficient	Standard Error	t value	Confidence Interval	
Charter School	.1357***	.0295	4.60	.0775	.1939
Ward 1	Used as Base for Other Ward Number coefficients				
Ward 4	-.0131	.0626	-0.21	-.1366	.1104
Ward 5	-.0676	.0666	-1.02	-.1990	.0638
Ward 6	-.0422	.0646	-0.65	-.1697	.0852
Ward 7	-.1145	.0595	-1.92	-.232	.0029
Ward 8	-.1514**	.06	-2.52	-.2697	-.0331
Constant	.4731***	.0552	8.56	.3641	.582
$R^2 = 0.1668$ n = 500					
* = Significant at the .1 level ** = Significant at the .05 level *** = Significant at .01 level					
Variable	Coefficient	Standard Error	t value	Confidence Interval	
Charter School	.115***	.0258	4.45	.064	.166
Ward 1	Used as Base for Other Ward Number coefficients				
Ward 4	.0316	.0564	0.56	-.0797	.1428
Ward 5	-.017	.0589	-0.29	-.1333	.0992
Ward 6	-.0145	.0585	-0.25	-.1299	.1009
Ward 7	-.1055**	.0517	-2.04	-.2075	-.0034
Ward 8	-.1463	.0498	-2.94	-.2445	-.048
Constant	.4321***	.0484	8.93	.3367	.5275
$R^2 = 0.3738$ n = 556					
* = Significant at the .1 level ** = Significant at the .05 level *** = Significant at .01 level					

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(Footnotes)

1 The authors calculated the percent of the population that is Black by dividing the population of Black individuals over the total population. The population data appears to be from 2000 and the income data may be from 2002.

2 This column in the data is POVFAM_. The authors assume that this is a percentage. Poverty guidelines for 2012-2014 are available in Appendix 1, figures 2-4. This also includes a note about the difference between poverty thresholds and poverty guidelines.

3 The coefficient on Ward 2 is significant, but this may not be a good estimate of the true value because of the small sample size for that Ward.

4 See above, footnote 12.