

# Using Machine Learning to Measure Changes in Cable News Coverage of Immigration (2014-2019)

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## ABSTRACT

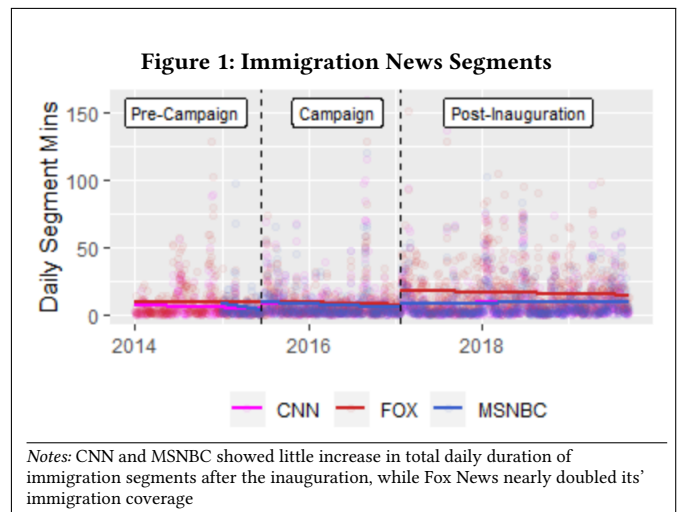
Did media coverage of immigration change after Donald Trump entered the Republican race, and again after he was inaugurated as President? We apply automated text analysis to every cable news segment since 2014 for Fox News and CNN (and since 2015 for MSNBC) and identify over 60,000 cable news segments about immigration. We examine both the selection into coverage of immigration and determine whether news frames about immigration shifted during and after the 2016 presidential campaign. We find that the volume of immigration coverage on Fox News nearly doubled after the 2016 election, as compared to more modest rises on MSNBC and CNN. We also find striking growth in the use of the crime frame in immigration coverage, with one out of every eight immigration news segments mentioning crime. Finally, we find that media discussions of immigration policy shifted to the right, eschewing traditional debates over comprehensive immigration reform in favor of more punitive measures. These findings have important implications for public attitudes towards immigrants in the era of Trump.

## INTRODUCTION

The issue of immigration took center stage during the 2016 election. Donald Trump launched his presidential campaign with a speech that claimed that immigrants from Mexico were "bringing drugs", "crime", and "rapists". Since 2016, record percentages of Americans have named immigration as the most important problem facing the nation[9].

There is evidence suggesting that media coverage of immigration has changed during the Trump administration. A report by the MIT Media Cloud found an increase in the overall media coverage of immigration, as well as an increase in the use of derogatory terms such as "illegal immigrant", primarily from media quotes of Trump administration officials[13].

However, the frequency of derogatory language about immigrants is only one aspect of immigration coverage. In this



paper, we use automated text analysis of cable news transcripts to better understand the changes in volume and framing of the immigration debate after Trump announced his candidacy and after he was elected as president. We analyze transcripts from three cable news channels (CNN, MSNBC, and Fox News), which allows us to determine whether these changes in coverage were limited to conservative media or were spread across the media spectrum.

We find that while TV coverage of the immigration issue did increase after Trump's inauguration, this increase was driven largely by Fox News, rather than MSNBC or CNN. Furthermore, we find that there was a dramatic increase in the use of the crime frame in the context of immigration on all three networks both after Trump announced his candidacy. Finally, we find that after Trump was inaugurated, the range of policy solutions discussed in the media shifted rightward, especially on Fox News. The media no longer discussed policies that would provide pathways to citizenship for undocumented immigrants, instead focusing on the more restrictive policies championed by the Trump administration.

## BACKGROUND

Scholars have described a number of media effects on public opinion. People who watch news broadcasts about a particular issue are more likely to name that problem as one of the nation's most important and more likely to weight that

**Table 1: Selected STM Topics**

Label	Top Words
<b>Border Security</b>	border, need, wall, secur, problem, system, build
<b>Skill-based Restrictions</b>	american, countri, job, peopl, worker, system, work
<b>Sanctuary Cities</b>	citi, feder, ice, sanctuari, california, enforc, communiti
<b>Comprehensive Immigration Reform</b>	reform, support, comprehens, citizenship, amnesti, path, posit
<b>Crime</b>	crime, crimin, commit, kill, deport, murder, time

*Notes:* These topics are generated using the STM package. Words displayed are the 7 highest probability words for each topic. Full model available here.

problem more heavily in their evaluations of political figures [8]. The relative strengths of competing news frames influence support for specific policies [5] including immigration [10, 11].

Major political figures can serve as one source of novel issue agendas and frames for the media [6, 12, 14]. Elite cues, as translated through the media, can then trigger significant changes in public opinion on an existing issue [4]. Indeed, elite cues filtered through the media helped spread significant misinformation and influence public opinion about the nature and origins of climate change [3].

Donald Trump made immigration policy a central tenet of his public image. In addition to proposing and instituting a number of policies designed to restrict immigration, Trump has tweeted about immigration 228 times since his inauguration<sup>1</sup>. Trump established himself as an anti-immigration candidate early - when voters in August 2015 were asked what terms they associated with Donald Trump, "immigration" was the most common answer[17].

Negative media frames of immigrants have been prevalent in media coverage before Trump arrived on the scene. Between 2000 and 2010, media portrayals of immigrants regularly showed immigrant arrests and detentions, implying criminality [7]. Portrayals of immigrants have been disproportionately male and Latino[18], invoking the "Latino threat" frame, which emphasizes criminality and lack of assimilation as common traits of immigrants from Latin America [1].

Yet, given Trump's common invocation of the immigrant criminality frame, we argue that there should be a significant increase in the crime frame in media coverage of immigration after Trump's entry into the Republican race and after his inauguration. Furthermore, we expect that this increase should be sharpest for the most conservative news outlet in our sample (Fox News), and weakest in the most liberal news outlet (MSNBC). We also expect that, in accordance with the Trump administration's priorities on immigration,

media discussion of immigration policy should focus on the merits of more conservative immigration policies (border security, restrictions on legal immigration, sanctuary cities), rather than more liberal ones (comprehensive immigration reform).

## METHODS

In order to measure changes in media coverage of immigration before and after the 2016 election, we use a structural topic model [19] to estimate the prevalence of various immigration-related topics within CNN, MSNBC, and Fox News transcripts. Structural topic models are a form of semi automated text analysis that allow for the inclusion of document covariates when estimating topical prevalence or content [15]. Topic models assign each document a topic proportion for each topic, which means that a document can (and often does) belong to multiple topics (eg 0.1 topic A, 0.2 topic B, 0 topic C etc).

We analyzed 61,229 immigration segments extracted from time-stamped cable news transcripts dated between 01/01/2014 and 09/01/2019<sup>2</sup>. We defined an immigration segment as a news segment containing at least two mentions of the keywords within 60 seconds: "immigr\*", "illegals", or "illegal alien". The documents were generated by extracting the text bounded by these two mentions. Multiple consecutive segments within 60 second of each other were concatenated into one segment. This procedure yields segments with high precision but only moderate recall - counting only text bounded by keyword mentions inevitably truncates the segments and underestimates the total length of the segment.

To estimate topic proportions, we use an 20 topic STM on the 61,229 immigration segments with an indicator variable for the time period relative to the 2016 election. The timeline is divided into three distinct periods: a pre-campaign (before Trump announced candidacy), campaign (between Trump candidacy and inauguration), and post-inauguration. We also include a variable for the channel (CNN, MSNBC, or Fox),

<sup>1</sup>Calculated by searching "immigr" on the Trump Twitter archive on December 13, 2019. <http://www.trumptwitterarchive.com/archive>

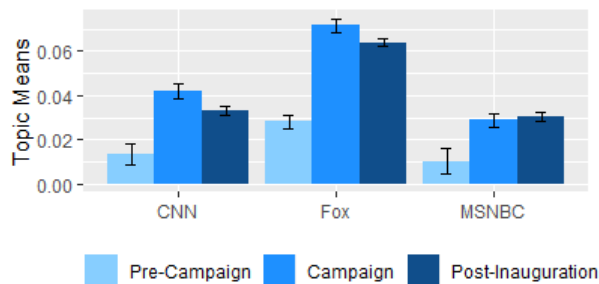
<sup>2</sup>MSNBC transcripts were available from 01/01/2015

**Figure 2: Immigrant Crime Coverage**

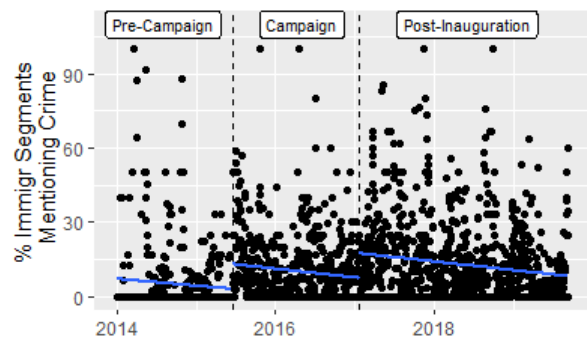
**A) Sample Crime Topic Document:**

the illegal immigrants and seven-time felon acquitted in the shooting death of kate steinle is sentenced to time served for a gun charge. felony possession was the only conviction for jose zarate in the november trial. the jury ruling steinle's death was an accident. jamal shaw whose 17-year-old son -- jamil shaw whose 17-year-old son killed by illegal immigrant said the

**B) Changes in Crime Topic Proportion:**



**C) % of All Immigration Segments Mentioning Crime:**



Notes: Figure 2A shows a sample document for the crime topic. Figure 2B shows the crime topic proportion - the average proportion of each immigration segment that is devoted to the crime topic. The crime topic increased significantly during the course of the campaign, and stayed at a similarly high level after the inauguration. Figure 2C assigns each document a 1 if the crime topic proportion was over 0.1 (document mentions crime), and a 0 if it was under (document does not mention crime). Due to the post-inauguration increase in immigration coverage on Fox News, there was a significant increase in the overall proportion of news stories about immigrants mentioning crime.

and interact it with the time period variable. Table 1 shows selected topics from this model<sup>3</sup>.

<sup>3</sup>Full topic model is available here

**RESULTS**

*Immigration Coverage Increased on Fox:* Figure 1 shows the daily duration of all immigration segments by date and channel. While MSNBC and CNN showed small increases in the overall duration of daily immigration coverage after the inauguration, moving from an average of 6.7 to 8.8 minutes for CNN and 6.8 to 8.8 for MSNBC, Fox News nearly doubled their coverage, going from 8.7 to 16.1 minutes<sup>4</sup>.

*Rise of the Immigrant Crime Frame:* For all three channels, the total proportion of the immigrant crime topic increased significantly during the campaign and after Trump was inaugurated. The increase was greatest for Fox News. Figure 2A shows a sample immigration segment that scores high on the crime topic. Figure 2B plots the average proportion of the crime topic in immigration segments during the pre-campaign, campaign, and post-election periods by channel. Fox news had the greatest increase in the immigrant crime frame during the election, followed by CNN. When coupled with the dramatic post-election increase in immigration segments on Fox News, these changes generated a dramatic increase in the overall amount of immigrant crime coverage on Fox.

The increase in immigration coverage on Fox News, coupled with the increase in the immigrant crime frame means that a larger percentage of news coverage portrayed immigrants as criminals. As each document belongs to multiple topics, simply plotting the average proportion of the crime topic per document (Fig 2B) can significantly underestimate the percentage of immigration segments that meaningfully link immigration and crime. In order to understand how much crime framing increased during this time period, we need to decide which segments mentioned crime and immigration in a meaningful way, and which ones did not. We set the threshold of meaningful crime mentions at 0.1 crime topic proportion. Figure 2C shows the percentage of news segments per day that have at least 0.1 crime topic proportion<sup>5</sup>. There was a dramatic increase in the percentage of news segments that mentioned immigrant crime, with only on average 4.8% of segments per day mentioning it in the pre-campaign period, as compared to 10.0% during the campaign period ( $p < 0.001$ ) and 12.6% post-inauguration ( $p < 0.001$ ). This means that in the post-inauguration period, one out of every eight news segments about immigration mentioned crime, as opposed to fewer than one out of twenty in the pre-campaign period.

<sup>4</sup>Due to the truncation of the segments at the keywords, these estimates should be treated as lower bounds

<sup>5</sup>In order to provide a reference for what a 0.1 crime topic document looks like, a set of 20 randomly sampled documents from the dataset that have at least 0.1-0.15 crime topic proportion is available here. 2014 does not include MSNBC, which may slightly increase immigration coverage with crime.

Figure 3: Immigration Policy Coverage

A) Sample Policy Documents by Topic:

**Border Security**

way to solve the immigration issue. >> the fence doesn't solve the problem. is it – is it necessary to have one? sure. would it help? sure. but to just say, build the damn fence and have that being the end of an immigration discussion

**Comprehensive Immigration Reform**

immigration. i said there should be a path years ago. when i talked about going forward. i didn't talk about amnesty. i said i opposed the gang of and the measure that marco rubio a posed. i said i'm not supporting that. i said that's a position i have changed on by listening to people. i made clear my position on immigration.

**Sanctuary Cities**

oakland's mayor and immigration officials. federal agents have arrested more than 150 people in northern california since sunday. the day before operations began, the oakland mayor, libby schAAF, warned the public. she said she was warning them to protect residents. oakland is a sanctuary city with a policy of not coordinating with federal immigration

**Skill-Based Restrictions**

immigration. "give me your tired, your poor, your huddled masses." it doesn't say anything about speaking english or be a computer programmer. aren't you trying to change what it means to be an immigrant coming into this country if you're telling them you have to speak english? kaents they learn to speak english when they get here? >> it's a requirement to be naturalized to speak english. second lae, i don't want to get into a whole thing about history. but the statue of liberty is a symbol of american liberty lighting the world. the poem added later is not part of the original statue of liberty. >> so you're saying that does not represent what the country has always thought of as immigration – i'm sorry.

B) Changes in Topic Proportions:



Notes: After Trump's inauguration, media discussion of more liberal immigration policies (comprehensive immigration reform) dropped, while discussions of more conservative policies (restrictions on legal immigration, crackdowns on sanctuary cities, border security) increased. All three channels showed relatively similar effects. Fox news significantly outpaced CNN and MSNBC in growth of the sanctuary cities topic, and MSNBC had a larger post-inauguration drop in comprehensive immigration reform than the other two. Plots of percentage of segments meaningfully mentioning these topics (topic proportion >0.1) available here.

*Range of Policy Solutions Shifted Right:* Figure 3b plots the overall topic proportion for 4 policy topics: comprehensive immigration reform, restrictions on legal immigration, border security, and crackdowns on sanctuary cities. There was a

significant decline in media discussions of comprehensive immigration reform after Trump was inaugurated, and instead a significant increase in discussions of legal immigration restrictions and sanctuary cities.

There was significant variation in discussions of these topics by channel. Fox News, while originally the biggest proponent of the discussion around sanctuary cities, also had the biggest increase after Trump was elected. Similarly, MSNBC had the largest post-election decline in discussions of comprehensive immigration reform, having slightly increased coverage during the campaign. However, all three channels showed broadly similar patterns in their post-election changes in the coverage of these four issues.

## CONCLUSION

Immigration coverage shifted dramatically during the 2016 campaign and the Trump administration. Trump's candidacy successfully injected the frame of immigrants as criminals into media coverage of the immigration debate. While Fox News was the most enthusiastic proponent of this frame, both MSNBC and CNN increased their post-election immigration and crime coverage. Ultimately, the crime frame proved to be a popular one for immigration media coverage after the 2016 election, with one out of every eight segments about immigration also mentioning crime.

While crime is indeed mentioned at a higher rate after Trump's inauguration, we were not able to parse what percentage of the news segments were debunking or fact-checking claims linking immigrants to crime. Still, conservative Fox News' status as the leader in immigration and crime coverage suggests that a significant portion of immigration and crime mentions were linking immigrants to crime, rather than disproving this link.

The policy debate within the media also shifted rightward after Trump's election. There were very few media discussions of comprehensive immigration reform after Trump was inaugurated, and a shift towards discussions of skill-based restrictions on legal immigration and crackdowns on sanctuary cities. This highlights the agenda-setting power of the presidential administration - opponents of the president's policies are reduced to arguing against them instead of producing their own policy alternatives.

These shifts in media coverage have very serious implications for Americans' views of immigrants. While many Americans profess positive feelings towards immigrants on surveys [2], hate crimes went up significantly in the counties in which Trump won by a larger margin [16]. Even if large numbers of Americans feel weakly positive towards immigrants, media frames that encourage violence or discrimination by a small few can significantly impact the lives of immigrants.

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