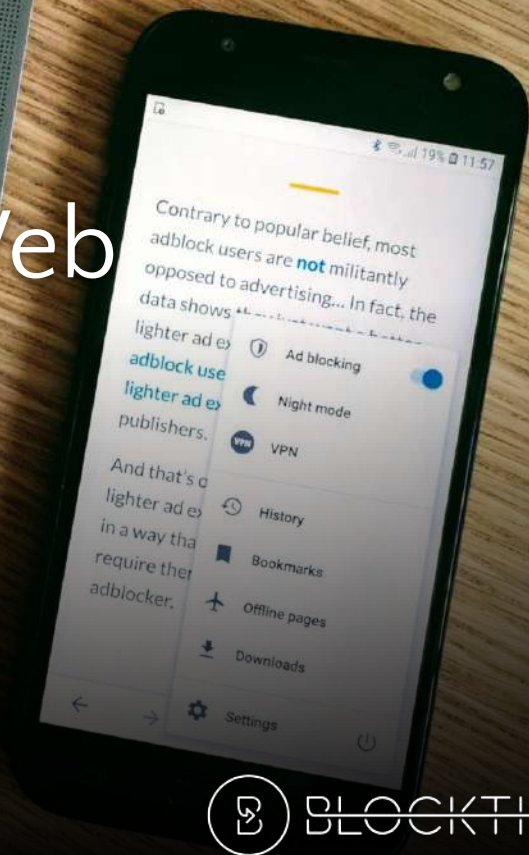


Growth of the Blocked Web

2020 PageFair Adblock Report



Foreword by [Sean Blanchfield](#), Former CEO, PageFair



This is the sixth report of this series that I have helped produce. In 2013, the founders of PageFair were “canaries in the coalmine” of blocked ads, coming from a background in web games content that was already badly afflicted. Many in the games sector were already losing a third of their ad revenue to blocking, but most publishers hadn’t yet identified the threat. We began publishing research to shine a light on the rapid growth of adblocking and motivations of its users, with the hope of catalyzing a change towards more sustainable advertising experiences. We did this by relying on empirical data, collected either from our own analytics network of several thousand publishers or derived from usage statistics provided directly by the adblock software creators.

By late 2015, the adblock issue had landed on the boardroom agenda of publishers everywhere. However, the short history of the digital media industry is one of crises. The adblock crisis was preceded by the shift to mobile, the emergence of video, and coincided with the ad fraud crisis. During 2016, minds were focused on solving adblocking, but in 2017, priorities shifted to the brand safety crisis, alarm over the margin-eating hegemony of the large Internet platforms, and then to GDPR and other privacy regulations that threaten attribution and programmatic ad targeting. While attention shifted from one crisis to the next, adblocking continued to grow, its impact softened only by a continued shift in usage to mobile, where adblocking was still nascent.

Mobile adblocking is now maturing, and measured globally, it dwarfs the desktop problem that focussed so many minds just three years ago. It should be alarming that mobile adblocking is not some niche technology used only by the digitally savvy: it is now a key differentiator used by brand-name tech companies to effectively compete against Google Chrome. It is here to stay, and is growing faster than desktop adblocking ever did.

Foreword by [Marty Kratky-Katz](#), Founder & CEO, Blockthrough



In 2015, the PageFair Adblock Report burst onto the scene as the industry’s de facto authority for all things related to adblocking. While Blockthrough was still in its embryonic stages, PageFair was making the industry aware of an upsurging trend that today impacts just about every publisher on the Web.

In its first edition since Blockthrough’s acquisition of PageFair in Q4 2018, this year’s PageFair Report showcases just how much the adblocking phenomenon has matured. Although desktop adblocking appears to have seen its peak, mobile adoption is growing rapidly.

This year’s report is also the first to feature a comprehensive breakdown of the diverse strategies top US publishers are using to mitigate the revenue loss that arose from adblocking, as well as an overview of the vendors that publishers are working with to resolve this complex issue. It’s a fascinating glimpse into how radically the adblock recovery category has transformed over the last five years.

Comprised of both adblock users and digital media veterans, our team at Blockthrough cares deeply about helping publishers deal with adblocking in a way that users find acceptable. And this year’s report definitively shows that our approach of helping publishers succeed with Acceptable Ads is an essential step in building a sustainably-monetized Web.

As the proud inheritors of PageFair’s early work in the space, we are honored to continue their legacy and once again objectively illuminate the state of adblocking around the globe, as well as to try to predict what the near future holds in store.

Adblock is Mobile

In this sequel to the last PageFair Adblock Report¹, we illustrate significant new trends in consumer adoption of adblocking around the world, including new empirical data for 2017, 2018 and 2019.

The battleground of the adblock wars has shifted to mobile. Mobile is driving a rapid expansion in the population of the Internet, and **a large portion of these people are starting out with browsers that block ads by default**. Meanwhile, in North America, Europe and Russia, adblocking has become a key theatre in the wider browser wars. Google Chrome has captured over half of global mobile market share in less than a decade, but virtually every significant rival is now competing by offering adblocking as a feature – a strategy that Google is unlikely to mimic.

The question now is whether Google can continue to leverage Chrome to neutralize adblocking, without losing significant market share or engendering accusations of anticompetitive behavior.

Lastly, our research also reveals that top US publishers have coalesced on a preferred adblock monetization strategy: Acceptable Ads, which is now supported by a diverse ecosystem of adblock extensions/apps/browsers and adtech vendors.

¹ The State of the Blocked Web, 2017 [\[link\]](#)

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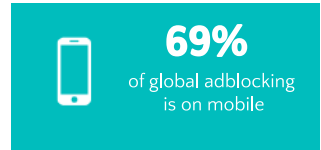
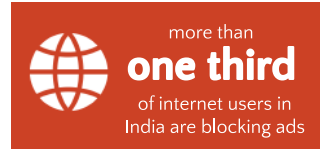
Key Insights

At the end of 2019:

- **527M** people were using mobile browsers that block ads by default, a **64% increase** from the last edition of the report (i.e. from December 2016).
- **236M** people were blocking ads on desktop, a **16% decline** from the last report.

Major trends:

- The surge in adblocking on mobile web is largely driven by the continued **success of UC Browser** in Asia, as well as by **Opera Mini enabling adblocking by default** in 2019.
- While Google has taken measures to deter adblocking, **its browser competitors** are differentiating themselves by **offering adblocking as a feature**.
- **49% of top US publishers** reviewed for this report **were using Acceptable Ads** to monetize opted-in adblock users.
- **82% of top US publishers monetizing via Acceptable Ads** do so with a **third-party vendor**, rather than working directly with participating adblockers.



The Adblock Landscape

- Adblocking is diversifying. It has been embraced by challenger browsers on mobile.
- VPN and DNS adblocking are also emerging.
- With the rise of the [Acceptable Ads ecosystem](#), many mainstream adblockers are evolving into “ad filters” which allow publishers to show light, more respectful ad experiences to opted-in users.
- This report conservatively estimates adblocking by measuring browser-based methods, and excludes users who block ads with content blockers, VPNs or DNS.
- Tracking prevention (e.g. Safari ITP) and data protection regulations are not covered in this report.

desktop

Web browser extensions
Popular in all major browsers

AdBlock Plus, AdBlock Ultimate, AdBlock, Adguard, uBlock Origin

mobile & tablet

Adblock browsers
block ads by default

UC Browser, Adblock Browser, Opera, Brave

Opt-in browsers
blocking must be switched on

Microsoft Edge, Firefox, Samsung Internet, Yandex Browser

Content blocking
block ads on iOS

AdBlock Plus, AdBlock, BlockBear, Crystal Adblock, Norton Ad Blocker, Adguard

+ hundreds more

cross platform

VPNs
Block ad-related traffic

PrivateInternetAccess, NordVPN, Windscribe, Perfect Privacy, Block This

Device DNS
Block ad-related traffic on single device

Adguard DNS, SecureDNS, Alternate DNS, PrivateDNS, AdBlock

Network DNS
Block ad-related traffic on all network devices

Pi-hole, SecureDNS, Adguard DNS, Alternate DNS, PrivateDNS

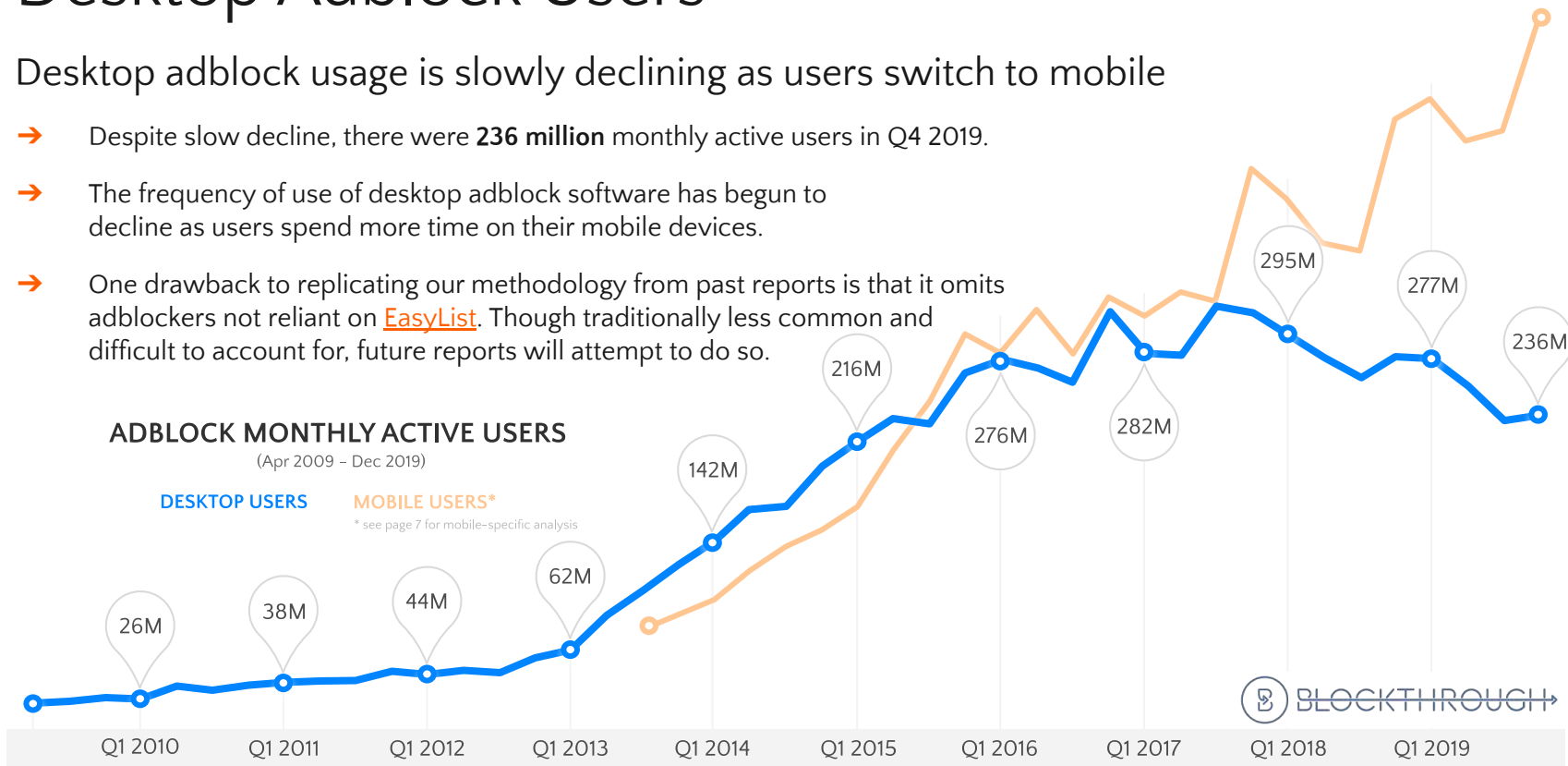
	blocks web ads	blocks in-app ads
browser extensions	✓	✗
3rd party adblock browsers	✓	✗
content blocking	✓	✗
VPN	✓	✓
DNS	✓	✓



Desktop Adblock Users

Desktop adblock usage is slowly declining as users switch to mobile

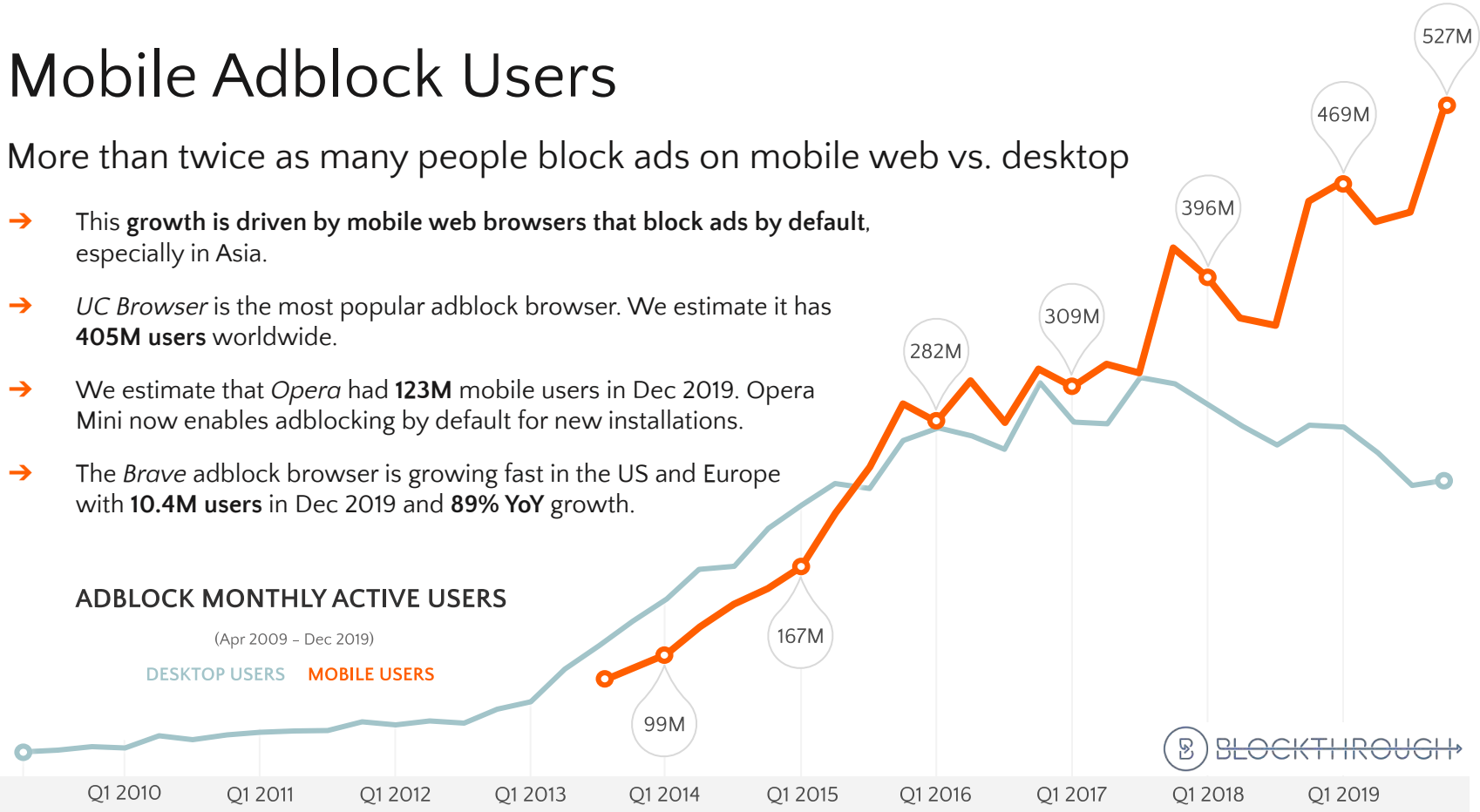
- Despite slow decline, there were **236 million** monthly active users in Q4 2019.
- The frequency of use of desktop adblock software has begun to decline as users spend more time on their mobile devices.
- One drawback to replicating our methodology from past reports is that it omits adblockers not reliant on [EasyList](#). Though traditionally less common and difficult to account for, future reports will attempt to do so.



Mobile Adblock Users

More than twice as many people block ads on mobile web vs. desktop

- This **growth is driven by mobile web browsers that block ads by default**, especially in Asia.
- *UC Browser* is the most popular adblock browser. We estimate it has **405M users** worldwide.
- We estimate that *Opera* had **123M** mobile users in Dec 2019. Opera Mini now enables adblocking by default for new installations.
- The *Brave* adblock browser is growing fast in the US and Europe with **10.4M users** in Dec 2019 and **89% YoY** growth.



Desktop Adblock Trends

Number of active installs on desktop is in slight decline but remains high.

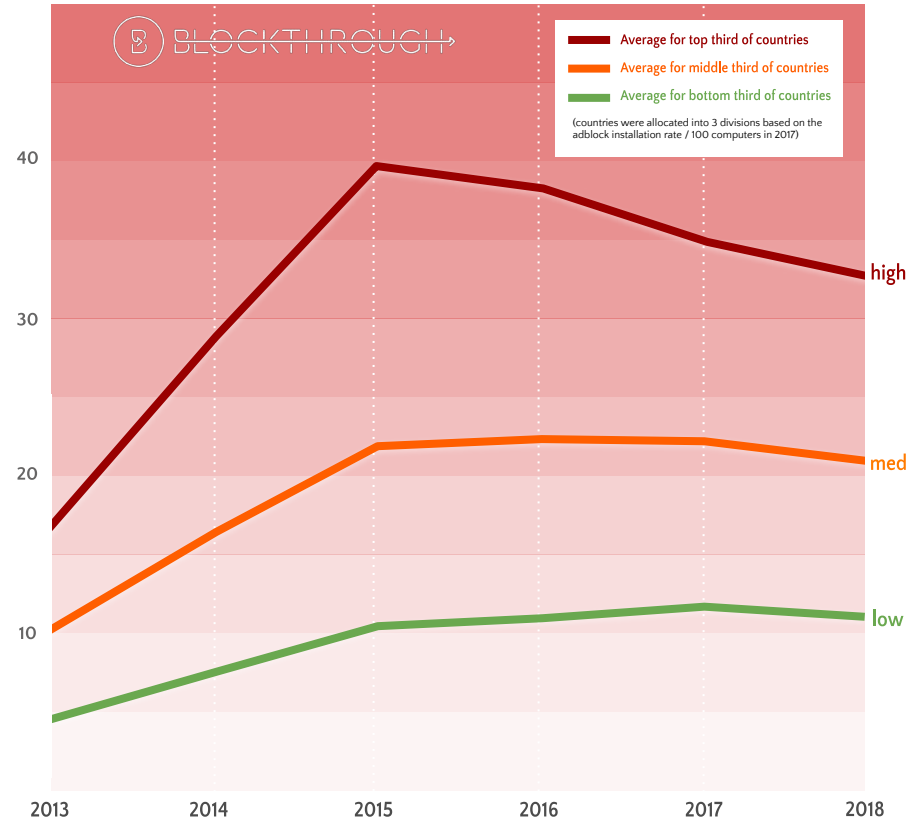
We gathered census data from 37 countries that disclosed the number of desktop computers in use between 2013 - 2018, and compared this to the number of desktop adblock MAUs in each country during those years.

Key Findings

- Census data reveals that the number of desktop computers in use in most countries has plateaued or is slowly falling.
- The active installation rate remains relatively stable in the US and UK.
- The active installation rate is falling faster in countries with higher historical rates (e.g. Germany, France, Poland) but remains high.
- The percentage of desktop traffic subject to adblocking tends to be higher than actual user adoption rates, as adblock users generally consume more pageviews.
- For a more granular breakdown of adblock rate by country, [contact us here](#).

Analysis

The slow reduction in active adblock installations can be attributed to decreasing usage of existing desktop computers, rather than people uninstalling adblocking software en masse.



Active adblock installations per 100 desktop computers

Mobile Adblock Trends





Virtually all mobile web browsers except Google Chrome now support adblocking

- A majority of the world's adblocking is due to UC Browser, with over **400M MAUs** at the end of 2019.
- According to Big Data Research, UC Browser held **35.9%** of the Chinese browser market in 2018, with the highest user satisfaction rating of any web browser¹.
- More mobile browsers than ever perform **adblocking by default**. This list includes **UC Browser, Opera Mini, Brave** and **Adblock Browser**.
- Most other major browsers now provide convenient opt-in adblocking, including Safari on iOS, where users can install content blockers, and Microsoft Edge.

¹<http://www.bigdata-research.cn/content/201811/788.html>

Adblocking is now a key differentiator for all browsers that compete against Google Chrome for market share.

Mobile Browsers that block ads by default

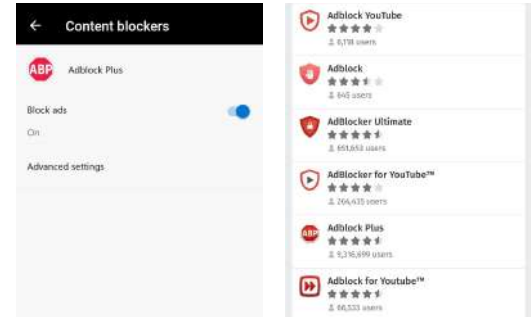
-  UC Browser had an est. 405M MAUs in December 2019
-  Brave launched in 2016, and grew from 1M to 10.4M MAUs in December 2019
-  Opera Mini deployed native adblocking in March 2016 and enabled it by default for new installations in 2019.
-  Adblock Browser was launched in 2015 by Eyeo, the company behind Adblock Plus

Analysis

Given the popularity of UC Browser in Asia and the fact that all major mobile browsers that compete with Chrome now support adblocking, we expect the growth of mobile adblocking to accelerate in North America and Europe.

Mobile Browsers with convenient opt-in adblocking

-  Safari (via content blocking)
-  Samsung Internet



Google and Adblocking

Key Findings

- Chrome is the most popular and fastest-growing web browser, largely due to the success of the Android OS, particularly in developing economies.
- Chrome's growth is almost matched by the combined market share of competing browsers that either perform adblocking by default, or support opt-in adblocking.

Google initiatives that have hampered adblocking

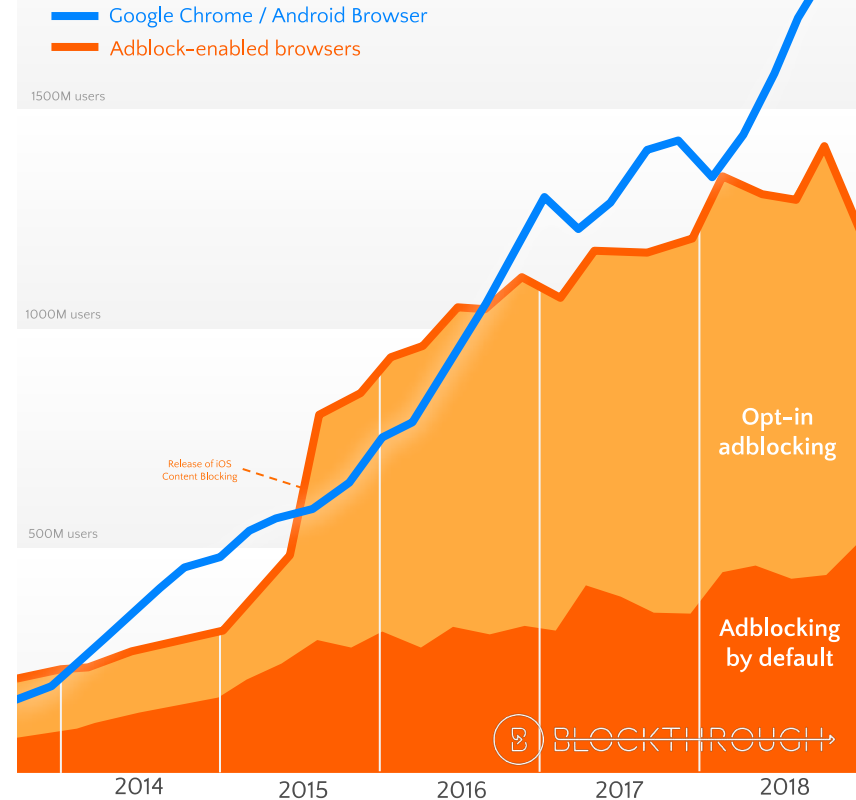
- In January 2018, Chrome shipped Asynchronous DNS, which **bypasses DNS-based adblocking** by instead using Google's own DNS servers.
- Chrome's planned *Manifest V3* update will **deprecate the Web Request API** that desktop adblock extensions rely on, and replace it with significantly limited functionality.
- Google's Play Store has **banned adblocking apps** which block ads in other apps on the basis that in-app adblocking could harm app developers and the Play Store ecosystem.
- Google never extended support for browser extensions to Chrome on Android.
- On desktop, the Chrome Web Store can now only be accessed from deep in the browser settings, and it is no longer possible to browse by most popular extensions, a list which is dominated by adblockers.
- In 2017, Google launched *Funding Choices*, a tool for publishers to control or block access to content for adblock users.
- In 2018, Chrome began penalizing websites that breach the *Better Ads* guidelines developed by the *Coalition for Better Ads*, with the aim of "tak[ing] the demand for adblockers out of the system", per Google's Scott Spencer¹.

Summary

Google has taken extensive action to make it difficult to block ads on Chrome, but in so doing, it has opened the door for adblock-enabled mobile browsers to compete and seize market share. Still, the strategy appears to be working on desktop, where Google has successfully leveraged Chrome's dominance to hamstringing desktop adblocking extensions and stifle their growth.

¹<https://www.adexchanger.com/online-advertising/googles-getting-ready-counter-ad-blockers-stumbling-blocks/>

Mobile Browser Global Market Share



Web browser usage data by Statcounter

The Adblock Monetization Landscape

It is challenging to monetize adblock traffic while keeping your visitors happy. A variety of vendors offer three fundamentally different strategies:

Ad Recovery via Acceptable Ads (“AA”)

This strategy entails serving ads that meet the lighter [Acceptable Ads spec](#) to opted-in users of participating adblocking extensions, browsers and content blockers. Large Internet platforms (e.g. Google, Amazon) can and do partner directly with participating adblocking companies to facilitate this, because they have full control over their advertising demand and can easily ensure compliance with AA. Publishers reliant on third-party adtech to monetize their properties would instead work with a dedicated provider like [Blockthrough](#) or with third-party vendors offering AA support as a feature, though the latter generally only offer AA support for their own demand.

Dedicated Providers

Blockthrough

Uponit (acquired by Blockthrough)

Acceptable Ads Exchange

AA Support as a Feature

Criteo AdRecover

Taboola Outbrain

Sovrn

Adblock Circumvention

Circumvention vendors use technological means to evade adblocking and display ads to adblock users, generally without attempting to deliver a lighter ad experience, nor giving the user the ability to opt out. In North America, adblock circumvention technologies have had compatibility issues with programmatic advertising and faced publisher concerns around user backlash, leading them to fall out of favor.

PageFair (acquired by Blockthrough)

Instart Logic

Apomaya

AdDefend

Publica

Oriel

Messaging

Messaging vendors help publishers display dialogs to persuade users to either disable their adblocker or contribute monetarily prior to accessing the content. “Soft” messaging means the dialogs can be dismissed, while “hard” messaging is effectively an “adblock wall” that prevents users from accessing content while adblocking is enabled. Publishers will sometimes build their own in-house messaging solution instead of working with a vendor.

Admiral

Sourcepoint’s Dialogue

Piano

Google’s Funding Choices

Oriel

In-house

Publisher Strategies

Top US Publishers overwhelmingly use Acceptable Ads

We reviewed the adblock monetization strategies employed on the websites of the top 100 US Comscore-ranked publishers impacted by adblocking: i.e. the top 100 that monetize with advertising on a platform where adblocking is viable. Of these, **56%** were found to employ at least one adblock monetization strategy.

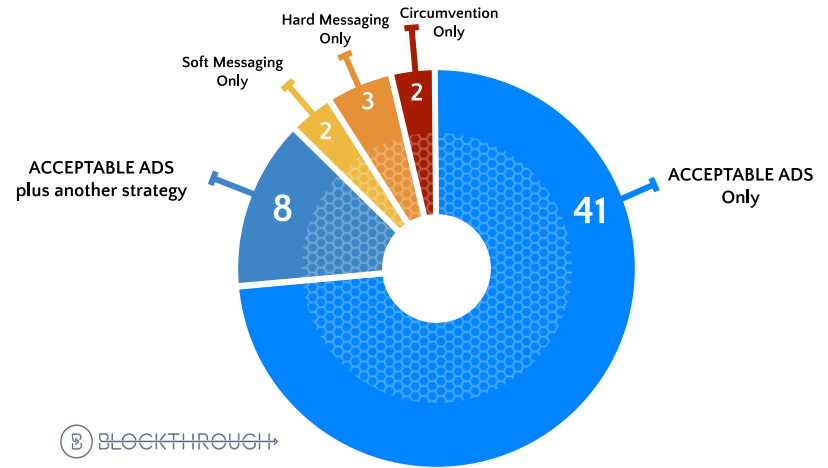
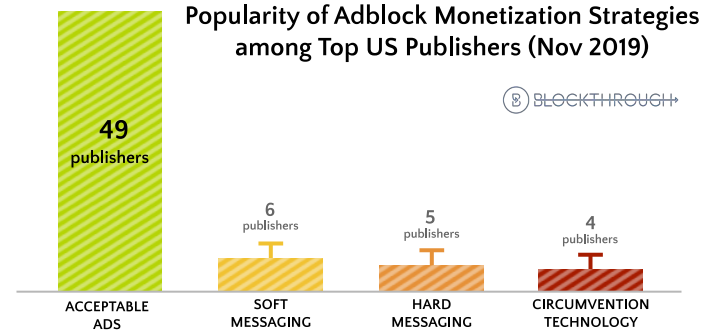
Key findings

Of the 56 publishers taking measures to monetize adblock users:

- **49 employed ad recovery via Acceptable Ads. Only 7 of these work directly with participating adblockers; the remainder work with one of the third-party providers listed on the previous slide.**
- 4 were found to employ adblock circumvention technology.
- 6 employed soft messaging, while 5 employed hard messaging. Over half of these publishers served Acceptable Ads to users who don't comply with their messaging request.
- **4 of the top 5 Comscore-ranked publishers in the US monetize with Acceptable Ads: Verizon, Amazon, Microsoft, and Google (for Search).**
- **Blockthrough was the most popular dedicated provider of ad recovery via AA, working with 30% of publishers using the strategy and working with 5x more publishers than the next-closest dedicated provider.**

Analysis

After several years of experimenting with various adblock monetization strategies, the top ad-funded publishers in America have embraced the Acceptable Ads ecosystem as their preferred channel for monetizing their adblocking audiences.



Adblock Monetization Strategies employed by Top US Publishers (Nov 2019)

ABOUT BLOCKTHROUGH

Founded in 2015, Blockthrough is the market leader in adblock monetization. Publishers use our best-in-class technology to serve Acceptable Ads to opted-in users, using their existing adtech stack.

We believe that publishers have the right to monetize their content, and their users deserve an outstanding experience.

We're also incredibly proud of [our talented, hard-working team](#) and [our recent acquisition of Uponit](#).

Next steps

Publishers

- Check out Blockthrough's [revenue recovery calculator](#) to get an immediate estimate of how much revenue you can recover with Blockthrough, or email us at sales@blockthrough.com.
- [Get in touch](#) to learn more about Blockthrough's market-leading adblock monetization platform, to measure your adblock rate or to find out more.
- Sign up to our [newsletter](#) and follow us on [Twitter](#) and [LinkedIn](#) to stay on top of the latest developments in the world of adblocking and Acceptable Ads.
- For a granular breakdown of adblock rate by device for your country, [contact us](#).

Journalists

- Feel free to reproduce any section of this report, so long as it's attributed to Blockthrough with a link to [our website](#).
- Visit the [PageFair archive](#) to see previous editions of the Adblock Report.
- [Contact us](#) for interview requests or clarifications.



Compatible with all wrapper solutions



No ads.txt update required



Leverage existing programmatic and direct demand



Adheres to Acceptable Ads & Better Ads

Methodology

Calculation of Desktop Adblock Users

The number of devices using adblock software on desktop/laptop computers was calculated by a similar methodology to that used in previous PageFair reports. This methodology estimates what number of monthly active adblock users is required to generate the number of downloads that were recorded for blocklists in each historical month.

A blocklist is a frequently-updated structured text file that contains rules about how to block ads on websites. All major desktop adblock software works by downloading one or more community-maintained blocklists to drive their behavior. Normally they download the “*Easylist*” blocklist, or download a *combolist*, which combines both Easylist and a language-specific blocklist. For example, “*Liste_FR+Easylist*” provides additional rules to block ads on the French web. Each blocklist includes an expiry header, which tells the client software how many days to wait before trying to download a newer version. For example, given a web browser configured with an adblock extension which is subscribed to a blocklist with an expiry of 4 days, that computer will download that blocklist once every 4 days so long as the browser remains open. If the web browser is shut down, it will re-download the blocklist at its next available opportunity. Most of the major community blocklists are mirrored on servers operated by Eyeo GmbH (“Eyeo”), the company that operates Adblock Plus (the most popular desktop adblock software). Eyeo therefore has 1st-party access to basic web statistics about the traffic received by each blocklist.

To perform this analysis, the number of downloads of each relevant blocklist were obtained from three different sources, spanning the period from April 2009 to December 2019. The first source was an online dashboard hosted by Eyeo that included blocklist download statistics from April 2009 – July 2013, which was copied into a database by PageFair in 2014. The second source was a new version of this dashboard that included per-country and per-extension granularity, which was also copied by PageFair into a database, with the most recent version including data up to December 2016. Both of these dashboards were taken offline by Eyeo during 2017, but the statistics that PageFair had recorded from them was transferred to Blockthrough as part of the Blockthrough acquisition of PageFair in Q4 2018. The third source was a CSV export of downloads per blocklist per country per day for the period of 1st January 2017 to 31st December 2019, which was provided to Blockthrough directly by Eyeo in support of this research.

Given that different blocklists have different expiry periods, and that a single blocklist may have its expiry period changed, it was then necessary to normalize the download counts so that data could be compared and treated similarly. A table of blocklist expiry changes was collected from information in public source control systems, PageFair’s historical research notes and *archive.org*. A study was then performed on how the traffic to blocklists scaled before and after each change to an expiry period. These scaling factors proved to be relatively consistent, transitive and commutative, and yielded a conversion table that predicted with fair accuracy how traffic to each list would scale during each observed incident of an expiry header change. This table was then used to normalize all data on blocklist downloads so that their values represented how many downloads would have been performed if every

blocklist had its expiry consistently set to one day.

The next step was to convert the normalized download data into an estimate of Monthly Active Users required to drive those downloads. This conversion could be performed using a conversion factor that had been previously determined by PageFair during the research for their 2014 report. This conversion factor was derived by comparing proprietary figures on the calculated number of active users of Adblock Plus (provided by Eyeo) to the number of normalized downloads of blocklists by Adblock Plus, during a 23-month period during which both data series were known.

Prior to this comparison, the active user data required some normalizing. The active user data was originally provided to Eyeo (as the publisher of Adblock Plus) by the [Firefox Add-Ons](#) store and by the [Chrome Web Store](#). Each store counts active users by measuring the number of requests for software updates they receive from web browsers. During the period studied, Firefox checked for updates once per day, while Chrome checked for updates once per week. Thus, the Firefox data represented Daily Active Users (DAUs), while the Chrome data represented Weekly Active Users (WAUs). To normalize these data into Monthly Active Users (MAUs), a third proprietary dataset was provided to PageFair by Eyeo, which consisted of the number of Daily Active, Weekly Active and Monthly Active unique IP addresses that downloaded adblock blocklists during 169 consecutive days in 2014. The range of unique daily and weekly IP addresses was approximately consistent with the Firefox and Chrome active user numbers and general Firefox/Chrome market share at that time. An assumption was made that the number of IP addresses used by the average active adblock user was close to 1.0, and that therefore the ratios of daily active, weekly active and monthly active IP addresses would closely mirror the ratio between DAUs, WAUs and MAUs. The ratios were calculated for each of the 169 measured days, producing two tightly-clustered data sets. The average Monthly:Daily ratio was **2.10** and the average Monthly:Weekly ratio was **1.09** (each with percent deviation less than 10%). The Monthly:Daily ratio was then applied to the Firefox active user figures to normalize them into MAUs, and likewise the Monthly:Weekly ratio was applied to the Chrome figures to normalize them into MAUs.

Now, given almost two years of authoritative daily measurements of active users of Adblock Plus on both browsers, normalized into Monthly Active Users, plus 1st party data on the number of downloads of each blocklist by Adblock Plus, the average number of MAUs required to cause an extra (normalized) download of a blocklist could be calculated. This produced the figure of **2.9253560152**.

A source code review was then performed of the major competing adblock extension (“Adblock for Chrome”), which indicated that it would exhibit the same download behavior as Adblock Plus, and an assumption was made that all other significant desktop extensions that relied on the blocklists would similarly respect the expiry headers in each blocklist. An assumption was also made the the typical behavior of an Adblock Plus user would be sufficiently similar to the behavior of users of competing extension that the Adblock Plus findings could also be generalized to them.

Note on uBlock Origin

Although most major adblock extensions download Easylist from Eyeo servers, uBlock Origin downloads easylist from *easylist.to*, and therefore its users are not estimated by this methodology. In previous reports (covering 2016 and earlier) this was not deemed an issue due to uBlock Origin’s relatively small user base. However, uBlock Origin has grown significantly in the intervening years. To ensure that its users were included

in our estimates, we took a different approach. The number of daily active users of uBlock Origin is listed on its Firefox Add-On Store page. The number of weekly active users were listed on its Chrome Web Store page, but this information was removed in August 2017. We used the cached versions of those pages from archive.org to build a history of the number of active users in each month in each browser. We noted that during the most recent 12 months during which there was data for both platforms (July 2016 - July 2017) that the ratio of users between the platforms was relatively stable, with a median of 2.3. We used this ratio to estimate the number of ongoing users of uBlock Origin on Chrome based on its Firefox usage. We then use the DAU:MAU and WAU:MAU ratios described above to convert all these numbers into MAUs, and we integrated the resulting monthly data series into our overall results.

Based on these assumptions, the normalized downloads to each blocklist were converted into MAU estimates, producing global monthly MAU estimates for the period April 2009 - July 2013, and both global and per-country monthly MAU estimates for the period August 2013 - December 2019.

Where this data is presented in this report as a measurement for a particular yearly quarter, the number given is the median figure for the months in the quarter in question.

Estimating Internet Population Per Country

Certain parts of our analysis required estimates of the number of Internet users in each country over time. For example, we use this as a denominator to approximate the penetration rate of adblock in each country and to estimate the number of users of each web browser.

To produce these estimates, we combined data from the United Nations on country populations over time [<https://population.un.org/wpp/Download/Standard/Population/>], and the percentage of individuals using the Internet in different countries over time [<https://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx>]. These data provided yearly figures for each country, but also had some gaps. Where a gap existed for the most recent year(s), we linearly extrapolated historical data to fill in the series. When a gap was in an early year, with no preceding data for the country, we linearly extrapolated backwards. Where the gap was bracketed by actual data points, we linearly interpolated between those data points.

Most of the calculations performed in this analysis are on a monthly basis, not an annual basis as provided for by this population data. To avoid misleading artifacts at the start and end of each year, we assumed the UN annual data represented mid-year measurements, and interpolated between each annual data point to produce monthly data. The leading 6 months and trailing 6 months of data for each country was then linearly extrapolated from the rest of the series.

Calculation of Mobile Adblock Users

Whereas the desktop adblocking can be nearly entirely measured via the download activity of blocklists, the majority of mobile adblocking is due to web browsers that block ads by default but do not download these lists. Therefore we cannot rely on the same method as desktop to produce a comparable estimate of how many people are blocking ads

on their smartphones. Instead, we have estimated the number of people using each kind of mobile browser, and have made the assumption that the user of this browser that blocks ads by default will remain an adblock user, while a user of a browser that does not block ads by default will continue to not block ads. For example, the figures for mobile adblock users in this report include users of UC Browser (which blocks ads by default) but does not include any users of Safari on iPhone (many of whom may have chosen to install a content blocker).

To estimate the number of users of different browsers, we relied on [StatCounter](#), which provides data that describes the percentage of traffic to their analytics network received from different web browsers. StatCounter's analytics network includes over 2 million different websites with over 10 billion page views per month, which is a large enough sample that it is often relied upon in these kinds of analyses. However, it should be noted that it does not attempt to adjust for any biases in its traffic. For example, it is possible that the a Chinese user who visits a site in Statcounter's network might be more likely to use Firefox than an average Chinese user. Using Statcounter's [global stats dashboard](#), we obtained monthly reports on the % of traffic from each desktop web browser (as a percentage of overall desktop usage) and % traffic from each mobile web browser (as a percentage of overall mobile usage) during the period of August 2013 - December 2019.

We also obtained monthly reports on the overall desktop / mobile platform usage during the same period, and then combined the datasets to produce a % traffic from each browser and platform during each month in the period.

To convert this into an estimate of actual users, we made the simple assumption that the fraction of Internet users that uses a particular browser in a country would be similar to the fraction of traffic from that browser from that country. For example, if in a given month, there were 4 million people using the Internet in Ireland, and 25% of their traffic was from Chrome for Android, we would assume that there are 1 million active users of Chrome for Android in Ireland.

We note that this methodology assumes that each individual accesses the Internet through exactly one device, which is not a fair assumption in many developed economies. For example, in the Ireland example, perhaps 50% of people regularly use Chrome for Android, but also use a laptop just as often. As a result, we might estimate 1 million active users instead of 2 million active users. Here we can see that the effect of our assumption is to, at worst, produce conservative estimates. However, we would still ideally minimise this error. Thankfully, we are studying mobile adblocking, which is currently most prevalent in countries with relatively low Internet penetration and therefore subject to a lower distortion effect from individuals generating significant multi-platform website traffic. In presenting our results, we are therefore making the additional assumption that there is a reasonably small undercounting error in our estimates of mobile web browser users in the countries where mobile adblocking is most prevalent (namely, India and China).

Note on UC Browser

While analysing the Statcounter data pertaining to UC Browser, we discovered that as UC Browser version 12.9 rolled out in late 2018, traffic numbers for UC browser appeared to quickly decrease. Upon deeper investigation, we determined that as UC Browser users upgraded to version 12.9 or later, the number of page views counted by Statcounter for those users would fall to 50% of its previous value. We noted that Statcounter had previous data for UC Browser annotated with remarks about errors due to the difficulty of counting UC Browser traffic. We corresponded with Statcounter about the anomaly, but they were unable to

find any explanation in their own systems. In our view, the reduction in UC Browser traffic did not appear to be organic, but seemed to be due to a change in behavior in version 12.9 onward, especially because the reduction of traffic precisely tracked the rollout of that version and later versions. We therefore formed the opinion that the correct course of action for this report was to rescale the traffic of UC Browsers versions 12.9 and later to 2X their previous value, which restored an organic usage trend for the browser.

To produce estimates of the number of users of adblock browsers, browsers were classified into two categories: "opt-in" adblock browsers (Firefox and Opera, and later Safari, Edge, Yandex and Samsung Internet) and "default-on" adblock browsers (UC Browser, Brave and Opera Mini). In some cases, browsers deployed adblocking over the period studied, producing sharp increases (e.g. the release of content blocking for iOS in September 2015). Note that figures for Brave could not be extracted from Statcounter data, so MAU figures disclosed publicly by Brave were used instead.

Where this data is presented in this report as a measurement for a particular yearly quarter, the number given is the median figure for the months in the quarter in question.

Estimating Desktop Computers Per Country

We also required an estimate of the number of desktop computers in as many countries as possible, so that we could study the number of desktop adblock users in isolation from the general shift towards mobile usage. The OECD provides statistics for 39 countries (for which suitable census data exists) on the number of households that have computer access at home, including data from 2005 to 2018

[https://stats.oecd.org/Index.aspx?DataSetCode=ICT_HH2]. This data set was analysed to determine the year-on-year change in household personal computers in each country. We then applied these year-on-year rates of change to data about the number of personal computers per 100 people in the same countries during the period 2005 - 2008, which was published by the World Bank

[<https://databank.worldbank.org/reports.aspx?source=1159&series=IT.CMP.PCMP.P2#>]. We then multiplied these estimates of personal computers per 100 people in recent years by the populations of those countries in each year, to produce an estimate of the absolute number of personal computers in each year in each of the 39 countries.

This data was then compared against the estimated number of MAUs of desktop adblock extensions in each year in each of these countries, producing an estimate of the installation rate of desktop adblocking in different countries.

Tables

Desktop and Mobile Adblock Users by Quarter

Quarter	Desktop		Total Mobile		Total Users
	Desktop Adblock Extension MAUs	Desktop Adblock Browser Users	Total Desktop Adblock Users	Total Mobile Adblock Browser Users	
2009-Q2	22,801,317		22,801,317		
2009-Q3	24,206,737		24,206,737		
2009-Q4	26,665,749		26,665,749		
2010-Q1	25,787,590		25,787,590		
2010-Q2	35,195,250		35,195,250		
2010-Q3	31,735,208		31,735,208		
2010-Q4	35,734,556		35,734,556		
2011-Q1	38,019,674		38,019,674		
2011-Q2	38,977,001		38,977,001		
2011-Q3	39,324,509		39,324,509		
2011-Q4	45,930,202		45,930,202		
2012-Q1	43,556,094		43,556,094		
2012-Q2	46,500,126		46,500,126		
2012-Q3	44,711,576		44,711,576		
2012-Q4	55,894,264		55,894,264		
2013-Q1	61,567,264		61,567,264		
2013-Q2	87,212,363		87,212,363		
2013-Q3	105,713,271		105,713,610	76,700,208	182,493,818
2013-Q4	124,951,818		124,951,949	88,034,664	212,986,613
2014-Q1	141,609,464		141,609,535	98,779,637	240,389,172
2014-Q2	164,850,144		164,850,144	120,643,514	285,493,658
2014-Q3	168,206,116		168,206,116	137,731,033	305,937,149
2014-Q4	196,834,716		196,834,716	149,665,982	346,500,698
2015-Q1	216,170,931		216,170,931	167,366,470	383,537,401
2015-Q2	233,992,731		233,992,731	209,082,894	443,075,625
2015-Q3	229,133,558		229,133,558	245,591,812	474,725,370
2015-Q4	266,690,414		266,690,414	294,953,787	561,644,201
2016-Q1	276,339,036		276,339,036	281,576,773	557,915,809
2016-Q2	270,082,677		270,082,707	313,236,256	583,318,963
2016-Q3	252,569,698	6,620,871	259,190,569	280,755,577	539,946,146
2016-Q4	304,296,826	7,517,424	311,814,250	322,002,537	633,816,787
2017-Q1	275,009,061	7,320,408	282,329,469	309,142,385	591,471,854
2017-Q2	271,599,815	8,727,679	280,327,494	325,922,457	606,249,951
2017-Q3	307,353,487	9,388,751	316,742,238	320,169,187	636,911,425
2017-Q4	295,190,589	16,567,890	311,758,479	417,313,060	729,071,539
2018-Q1	275,570,639	19,273,301	294,843,940	395,748,784	690,592,724
2018-Q2	259,294,424	18,830,384	278,124,808	362,437,846	640,562,654
2018-Q3	243,348,309	20,300,646	263,648,955	356,773,300	620,422,255
2018-Q4	261,093,238	17,338,294	278,431,532	453,890,309	732,321,841
2019-Q1	262,176,462	15,023,880	277,200,342	469,283,016	746,483,358
2019-Q2	242,822,621	14,118,495	256,941,116	438,400,412	695,341,528
2019-Q3	220,808,738	11,498,618	232,307,356	445,642,224	677,949,580
2019-Q4	225,577,987	10,764,306	236,342,293	527,169,254	763,511,547

Mobile Adblock Browsers vs Chrome

Quarter	Total Default Adblocking	Total Opt-in adblocking	Chrome & Android (Mobile)
2013-Q3	76,780,208	118,026,616	168,036,418
2013-Q4	88,034,664	128,896,023	193,203,734
2014-Q1	98,779,637	126,857,736	252,854,887
2014-Q2	120,643,514	135,054,964	322,889,850
2014-Q3	137,731,033	145,586,791	394,982,985
2014-Q4	149,665,982	144,290,606	454,691,331
2015-Q1	167,366,470	144,088,875	479,277,442
2015-Q2	209,082,894	175,738,270	541,451,455
2015-Q3	245,591,812	226,358,531	575,693,934
2015-Q4	294,953,787	490,372,636	594,310,192
2016-Q1	281,576,773	555,824,145	649,514,654
2016-Q2	313,236,256	603,418,376	742,970,903
2016-Q3	280,755,577	673,151,506	792,131,455
2016-Q4	322,002,537	711,087,454	902,862,665
2017-Q1	309,142,385	727,308,618	1,024,726,639
2017-Q2	325,922,457	785,098,547	1,154,484,992
2017-Q3	320,169,187	746,450,318	1,293,823,181
2017-Q4	417,313,060	742,520,862	1,228,649,232
2018-Q1	394,493,377	766,567,155	1,291,214,693
2018-Q2	359,609,455	812,727,875	1,397,571,258
2018-Q3	353,680,987	845,891,076	1,427,051,023
2018-Q4	450,665,635	887,779,901	1,344,842,793
2019-Q1	466,615,198	837,907,299	1,434,188,624
2019-Q2	435,204,161	847,411,686	1,576,981,611
2019-Q3	441,740,510	963,947,031	1,756,039,886
2019-Q4	523,959,325	689,407,436	1,844,213,254

Default Adblocking = mobile web browsers with adblocking enabled by default

Opt-in adblocking = mobile web browsers for which adblocking is available but disabled by default (built-in option, add-on or content blocker)

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