DevSkiller

Top IT skills report 2020: Demand and hiring trends

2020
REPORT

INTRODUCTION

The IT skills market continues to be one of the hottest labor markets in the world, with the Bureau of Labor Statistics projecting a **25.6% increase in IT job growth in the US alone in the next 10 years.**

What is clear is that in order to effectively compete in this increasingly competitive area, recruiters and hiring managers need granular data about developers' IT skills for each position they want to fill.

Our core mission is to give tech recruitment decision-makers the tools and information they need to make the best hires. As part of our commitment to the industry, this is the second year we're publishing the aggregated data from our platform.

As you read the report, you'll find that some areas have not changed a lot like the IT skills that companies seek out. Other areas have made huge swings since the last year like the US's position as an international IT skills labor market.

To measure the current customer base, the report this year contains a larger dataset from **213,782 coding tests** sent to developers in **143 countries by companies in 49 countries.**

This year's report also explores new topics such as the most popular technologies in tech stacks and whether recruiters are using tools to tackle unconscious bias in recruiting, all designed to give you the right information when hiring developers.

Jakub Kubrynski
DevSkiller CEO

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CHAPTER I

Technical hiring & IT skills insights

1

JavaScript is the most popular IT skill devs are tested in **(40%)**

JavaScript is the most in-demand IT skill of 2020. This just goes to show how important the front-end has become to software development. After **JavaScript comes SQL, with Java, HTML/CSS, and .NET/C# rounding out the top five.**

Language	Percentage
JavaScript	40%
SQL	33%
Java	31%
HTML/CSS	20%
.NET/C#	12%

0%   10%   20%   30%   40%

The explanation of why the percentages don't add up to 100% can be found on page 37 →

This is an interesting move as Java and JavaScript have switched places since last year. It just goes to show that while large back-end teams are still important, the overwhelming need for developers to work on web apps has eclipsed the need for them to create large back-end systems. This conclusion is in line with **Stack Overflow's 2019 Developer Survey, which found JavaScript to be the most popular language among professional developers.**

Another interesting result is that in general, all of these IT skills are used in a much higher percentage of tests than they were last year. There is more about this in section 3 but this shows generally that fewer companies are looking for highly specialized IT skills. Instead, more and more are looking for developers who might have some skills outside their chosen tech stack. For instance, **a JavaScript test will probably also include SQL and or Java.**

2

72% of companies are looking for **JavaScript developers**

THE TOP 5 LANGUAGES THE MOST COMPANIES ARE LOOKING FOR TECHNICAL SKILLS IN

Language	Percentage
JavaScript	72%
SQL	55%
Java	53%
HTML/CSS	46%
.NET/C#	36%

0%   20%   40%   60%   80%

The explanation of why the percentages don't add up to 100% can be found on page 37 →

In 2019, **72% of companies looked for JavaScript developers**. This means the needs of companies have remained steady over the last year. While there have been small changes to some tech stack's overall popularity, the top 5 have held onto their positions from last year. JavaScript has added a couple of percent of companies who test developers in the tech stack. **SQL has added 1% of companies rising to 58% while Java has jumped 5% to 53%. HTML/CSS has stayed at 46% while .NET/C# has lost 5%, dropping to 36%.**

This clearly shows that JavaScript remains essential as the premier front-end IT skill, a trend also seen in the open-source community with JavaScript holding the top spot in GitHub's The State of the Octoverse. SQL, on the other hand, remains the premier database IT skill. You do see a bit of push and pull between Java and .NET/C#. Considering that these two tech stacks are used to solve similar problems, it seems that companies are moving towards Java and away from .NET on the margins. Still, they remain very popular among a large number of companies.

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3

Most developers will get **a JavaScript IT skills assessment**, regardless of their main focus
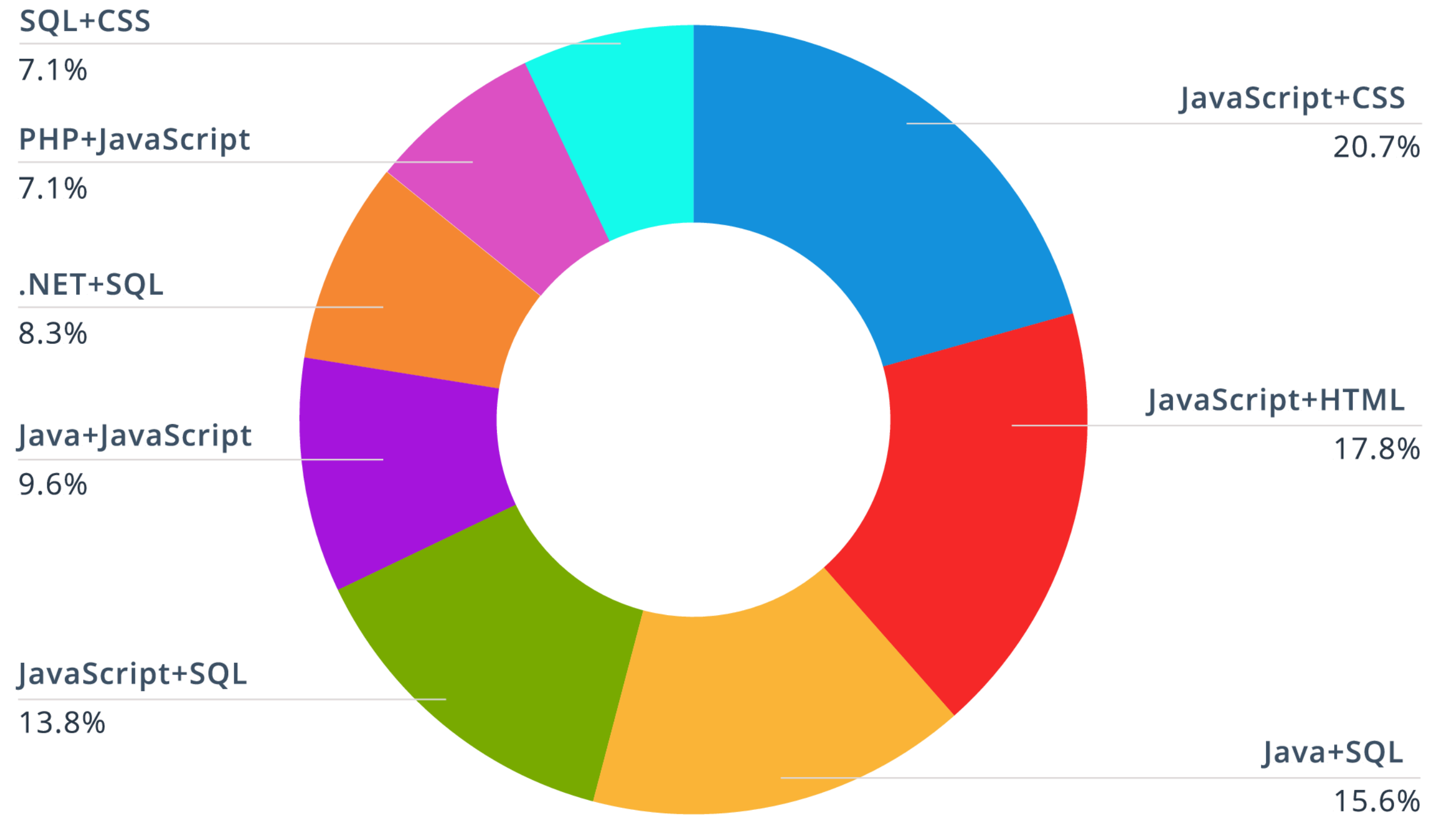
JavaScript has cemented its reign over every category so far, so it's no surprise that the language most commonly tested with other technologies is, of course, JavaScript.

We looked at **the top eight technologies** tested together this year and found that there is actually been quite a lot of change over last year.

JavaScript+CSS come in at the top spot, with last year's top combination, Java+SQL relegated to third. Beyond that, we see other various combinations of back-end languages and front-end languages like Java+JavaScript, .NET+JavaScript, and SQL+JavaScript. The other common trend that we saw last year is still present. This is both front-end and back-end technologies coupled with SQL, with Java, JavaScript, .NET, CSS, and PHP coupled with SQL.

What these findings show is that when it comes to full-stack development, the combination of IT skills required are increasingly JavaScript on the front-end along with SQL to compliment a server-side tech stack.

THE TOP 8 LANGUAGES TESTED TOGETHER

SQL+CSS
7.1%

PHP+JavaScript
7.1%

.NET+SQL
8.3%

Java+JavaScript
9.6%

JavaScript+SQL
13.8%

JavaScript+CSS
20.7%

JavaScript+HTML
17.8%

Java+SQL
15.6%

4

React, Spring, ASP.NET, MySQL, HTML, Data Analysis, and Laravel are the most popular technologies in their respective tech stacks*

JS	**JavaScript**	
1	React	33.42%
2	ES6	26.28%
3	Angular2+	14.36%
4	Node.js	11.14%
5	Vue.js	8.70%

	Java	
1	Spring	46.93%
2	JPA	29.41%
3	Spring Boot	16.02%
4	Maven	12.77%
5	Gradle	7.76%

	.NET/C#	
1	ASP.NET	55.47%
2	MVC	42.24%
3	EntityFramework	27.74%
4	.NET Core	18.07%
5	SQL Server	11.96%

	SQL	
1	MySQL	37.13%
2	SQL Server	35.99%
3	PostgreSQL	9.96%
4	Oracle	9.39%
5	HSQLDB	7.82%

CSS

1	HTML	63.16%
2	WCAG 2.0	25.53%
3	HTML 5	17.37%
4	LESS	9.47%
5	Sass	6.84%

Python

1	Data Analysis	29.76%
2	Django	21.8%
3	NumPy	8.65%
4	Pytools	6.23%
5	Pandas	3.46%

PHP

1	Laravel	28.30%
2	Doctrine	12.08%
3	CodeIgniter	10.94%
4	Symfony	8.68%
5	PDO	3.40%

One of the central tenets of **RealLifeTesting**[TM] is that developers should be tested not only in the languages that they'll use but also in their ability to understand the tools and resources of the tech stack that they will need to work with. Because our tests are created with the tech stack in mind, we can see what the most popular IT skills, resources, and technologies are in the most popular tech stacks.

JS

React leads the JavaScript stack with **33%** of tests

To no one's surprise, **React comes in as the most popular resource in the JavaScript tech stack**.

React has topped the hiring tends of Hacker News for a few years now so it makes sense that a third of all JavaScript developers will be tested on this resource. ES6 comes in a close second with a quarter of all JavaScript developers tested using it and Angular2+ comes in third. The possible reason for Angular being so low on the list is that while AngularJS has been on its way out, there still is some lag with Angular 2+ becoming more popular in the Angular Community. Coming in fourth is Node.js which allows developers to use JavaScript on the server-side. Rounding out the top-five is Vue.js.

Spring is used in **47%** of Java tests

In the Java tech stack, Spring is even more overwhelmingly popular than React is for JavaScript. Close on its heels is JPA, included in roughly 29% of Java coding tests. Spring Boot comes in at third with 16%. Popular Java build tools, Maven and Gradle come in fourth with 13% and fifth with 8% respectively.

ASP.NET is the most popular .NET/C# technology, used in 55% of tests!

ASP.NET, the popular web app framework is the most used technology in the .NET tech stack. ASP.NET's position shows the importance of web development to the .NET/C# tech stack. MVC architecture and Entity Framework are used in 42% and 28% of the tests respectively. Coming in fourth is .NET Core, .NET's open-source, portable version which is gaining popularity. Rounding out the top 5 is SQL Server, .NET's server technology.

MySQL leads the SQL stack with 37.3% of the tests

In the database field, there's a pretty even split. MySQL is used in almost 40% of SQL tests while SQL Server is used in about a third. PostgreSQL is used in about 10%, about the same as Oracle. HSQLDB comes in fifth with 8%. This last entry means that recruiters are testing general SQL knowledge that is not related to a specific server.

</>

CSS and HTML go together with HTML tested in **63%** of tests

Once again, it is not surprising that HTML figures strongly in the CSS tech stack, as CSS and HTML are closely intertwined. Probably the most interesting thing is the fact that HTML is still tested as a separate entity. This proves that while it might be easy to learn, it requires specialist skills to master.

After that, the accessibility standard WCAG 2.0 is used in about a quarter of all CSS tests. While not a technology, accessibility is an increasingly important consideration in web development. HTML5, **HTML's more media-focused version comes in at 18%, while CSS framework Less and alternative style sheet language Sass come in at positions 4 and 5 respectively.**

Data analysis is used in **30%** of Python tests

Data science is a major application for Python so it is not surprising that Data Analysis is the most common IT skill in that stack. Python's other main application as a server-side web development technology is the second most popular with Django appearing in roughly one out of every 5 coding tests. Numpy, Pytools, and Pandas come in third, fourth, and fifth respectively.

PHP is not dominated by one resource with Laravel used in only **28.3%** of tests

In the PHP stack, Laravel is the strongest resource. Interestingly, there are not as many overwhelming technologies in this stack with Doctrine, CodeIgniter, Symphony, and PDO only used in relatively small percentages of all PHP tests.

*updated on January 17, 2020

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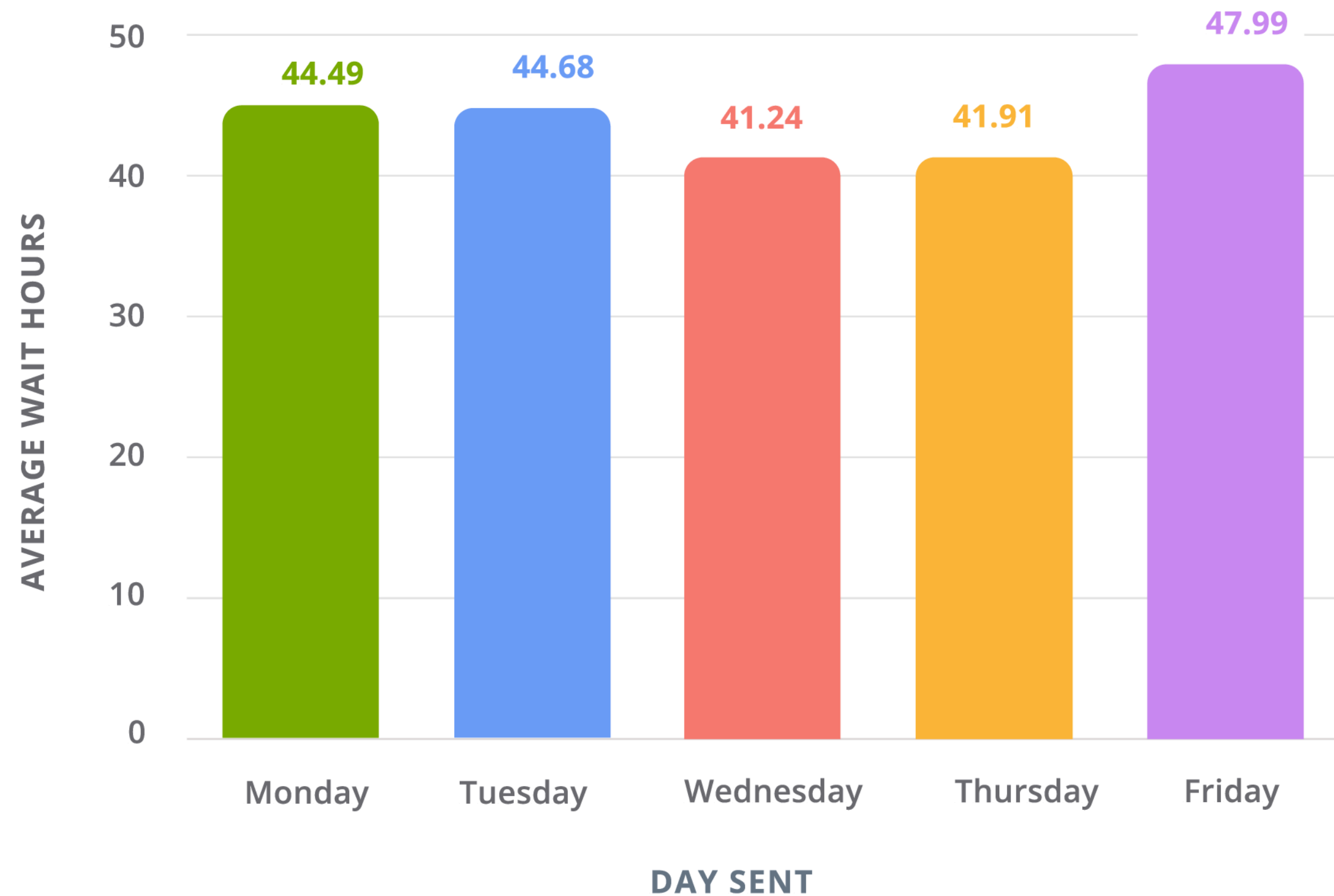# Candidates wait on average **2.27 days** to take a coding test

The average time a candidate waits between retrieving a coding test invitation and taking the test is **2.27 days**. **This is down from 2.88 days in 2018**. The drop in time suggests that candidates are taking coding tests more seriously as a part of the hiring process. Rather than putting coding tests off, developer candidates are acting on them more proactively. This could be in part an effort on the candidate's part to shorten the hiring process and field multiple offers at once.

6

Coding tests sent on **Wednesdays** get the fastest response

Coding tests sent on Wednesday get the fastest responses. This is a sharp reversal from last year when coding tests sent out on Wednesday had the slowest response. What we do see though in section 5 is a shortening of the average time it takes to send back a completed coding test. From this, we can assume that candidates are most likely to take the test at the same time of the week (i.e. Friday evening) but are acting on them more quickly.

THE AVERAGE WAIT IN HOURS BASED ON THE DAY OF THE WEEK THE INVITE IS SENT

AVERAGE WAIT HOURS

- Monday: 44.49
- Tuesday: 44.68
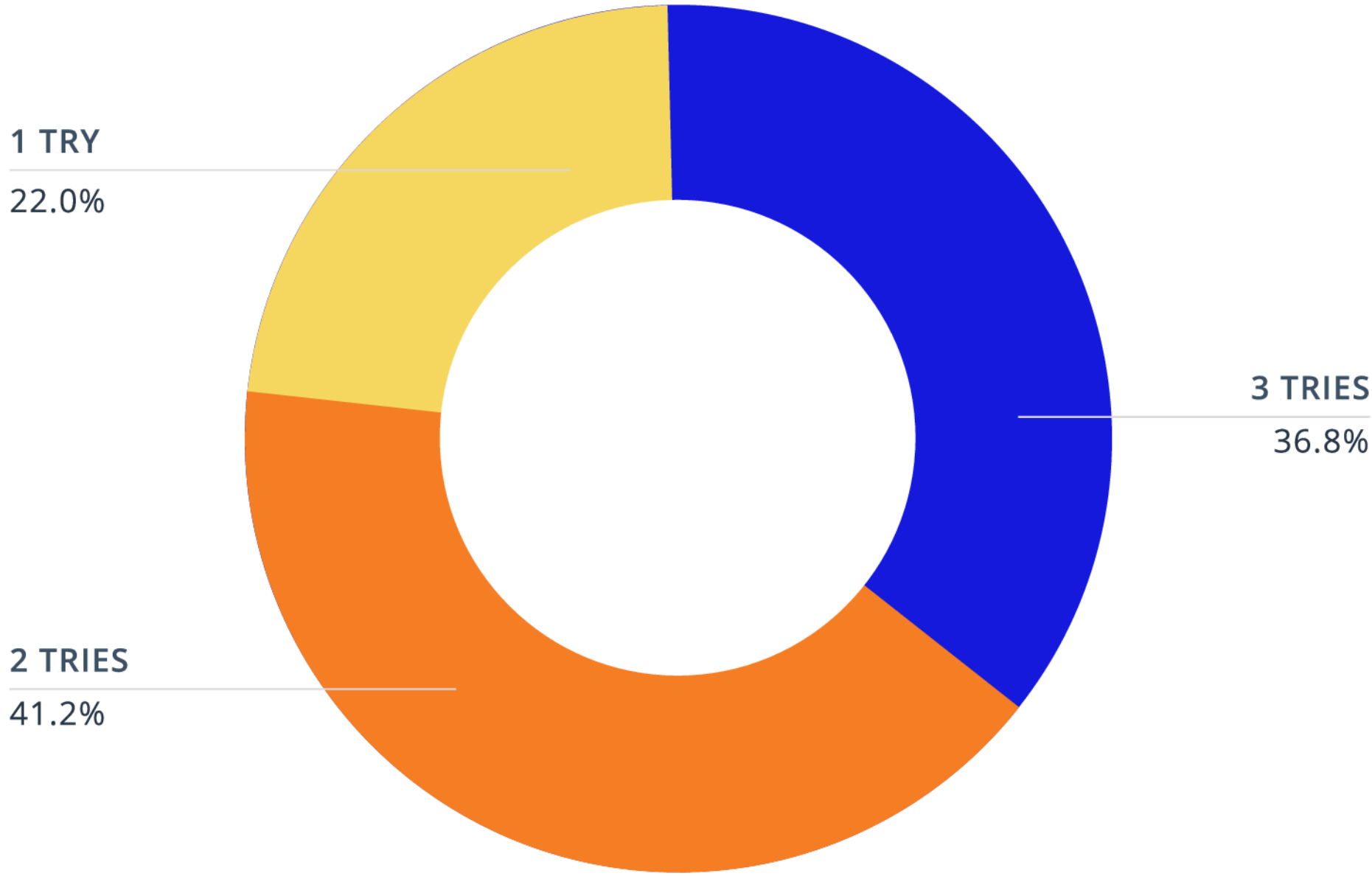- Wednesday: 41.24
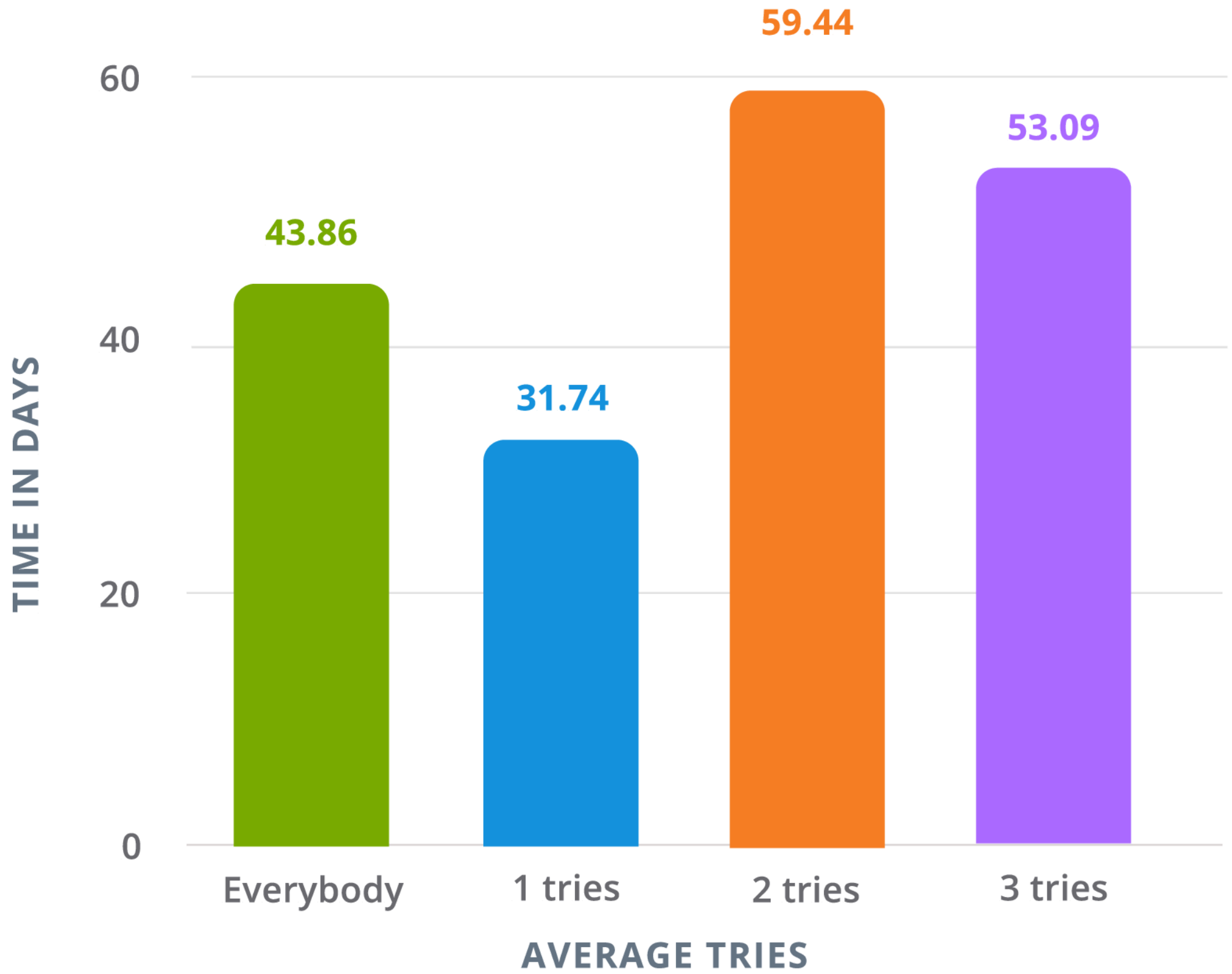- Thursday: 41.91
- Friday: 47.99

DAY SENT

7

Less experienced tech recruiters are taking extra time to develop themselves

DevSkiller's Tech Recruitment Certification

course is proving to be sought after by even more tech recruiters than last year with roughly double the attendance. An interesting outcome, though, is that tech recruiters have been needing more time to pass the course and get their shiny LinkedIn badge.

THE NUMBER OF TRIES IT TAKES RECRUITERS TO BECOME TECH RECRUITMENT CERTIFIED

1 TRY
22.0%

3 TRIES
36.8%

2 TRIES
41.2%

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THE TIME IN DAYS IT TAKES RECRUITERS TO BECOME TECH RECRUITMENT CERTIFIED DEPENDING ON THE NUMBER OF TRIES THEY NEED TO PASS

Over half of the people who pass the course now do so after two tries compared to one try last year. They do so over a longer period of time, almost 60 days. In fact, the average time recruiters take to pass the course in two tries is about a week longer than it takes those who pass the course on three tries. This shows that when recruiters don't pass the first time, instead of taking the test over and over, they take the time to look at the material again.

8

Recruiters are slow to take up bias reducing technologies

Interviewer bias is an important issue in tech as candidates from non-traditional backgrounds are often eliminated for unconscious reasons. Interestingly, our data finds that tools that can be used to eliminate this bias are still not being taken up by most tech recruiters.

DevSkiller's feature to anonymize candidate reports for hiring managers was only used in 6% of the reports generated.

6% of reports are anonymized

This means that most tech recruiters are missing a huge opportunity to objectively evaluate candidates on their IT skills without taking irrelevant personal details into account. This is one metric that we would like to see an increase in next year's report as it will benefit employers, candidates, and the industry as a whole.
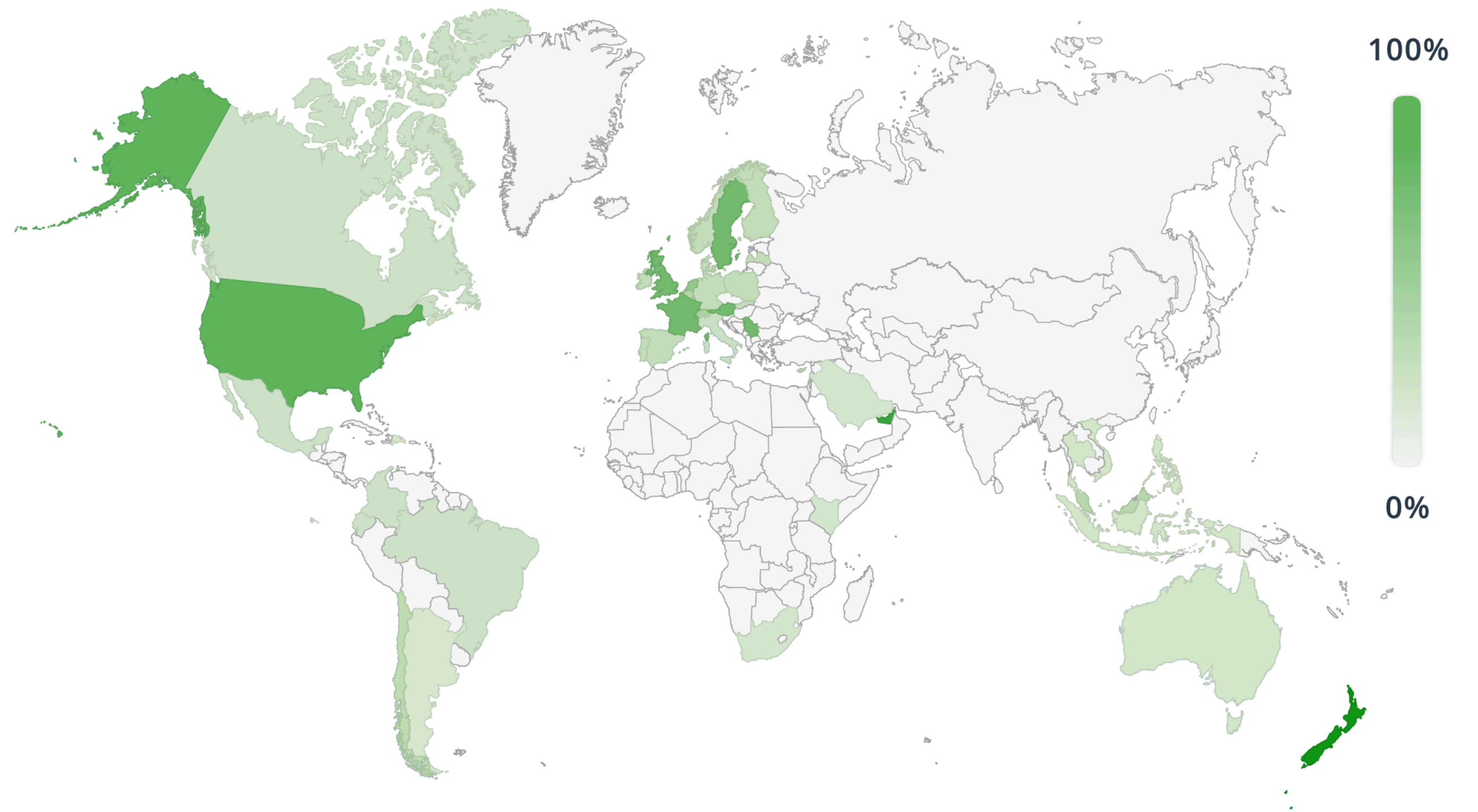
CHAPTER II

The geography of IT skills recruitment

The US is doing more overseas technical recruitment while the UK and Germany are both doing less

International hiring for tech workers continues to be a hot trend for companies all over the world. Many countries have seen their companies looking further outside their borders for tech talent than last year.

The US, France, and New Zealand have all seen the percentage of their international technical hiring go up. Other countries dealing with possibly slowing economies and political uncertainty like the UK and Germany have both seen their international technical recruitment rate decrease.

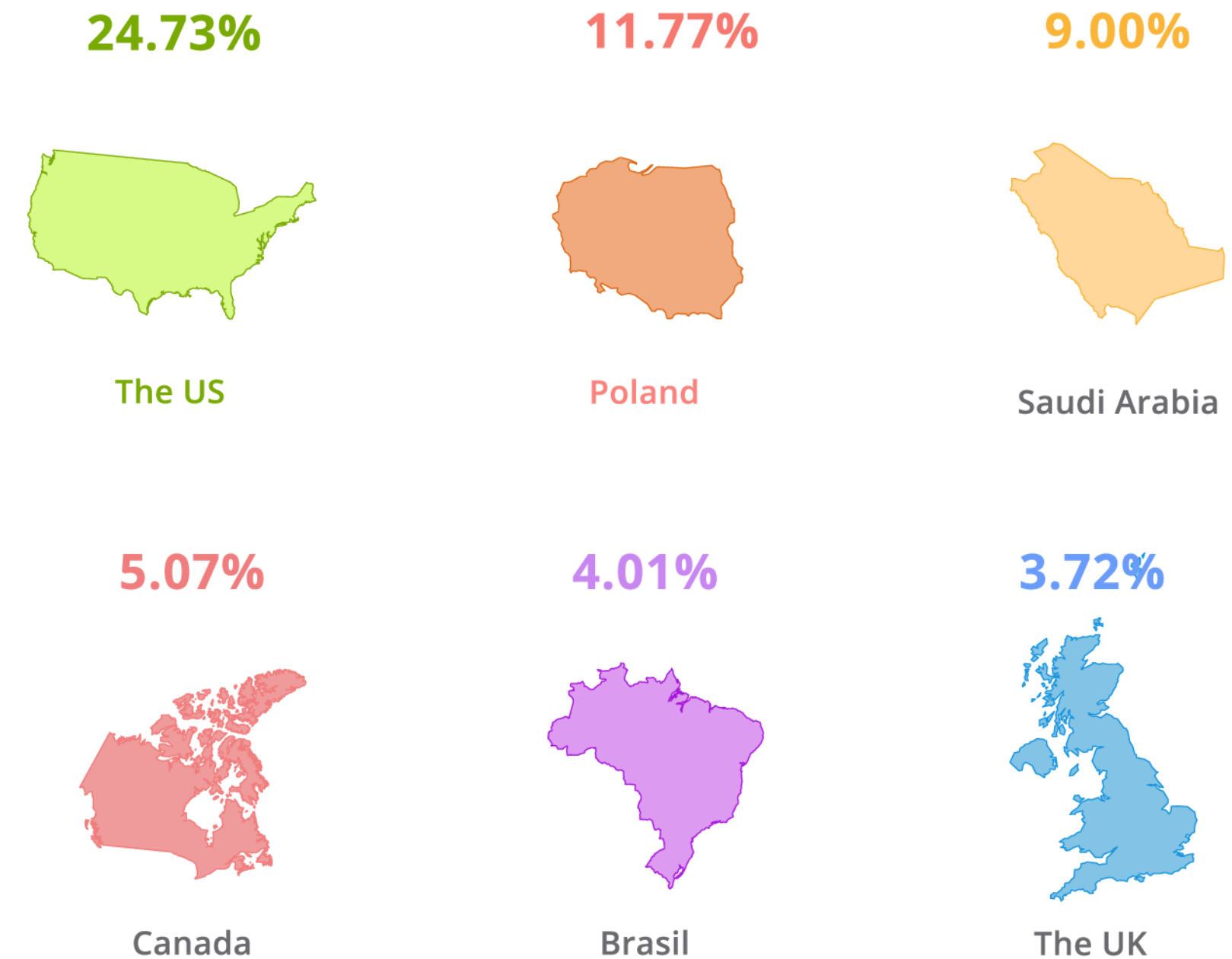**THE PERCENTAGE OF INTERNATIONAL TECHNICAL HIRING BY COUNTRY**

100%

0%

10

The US recruits **a quarter** of all overseas developer candidates

The US and Poland still remain the top two drivers of international technical hiring, but their overall percentage has gone down compared to last year as we widen our reach to companies in more countries.

The UK, which was previously the third-largest driver of international tech recruitment, has dropped to 6th place. This is possibly because of the uncertainty in their access to an international labor pool caused by Brexit. In their place, Saudi Arabia has risen to the number three spot, possibly based on the new focus on technology in that country.

THE PERCENTAGE OF TOTAL OVERSEAS CANDIDATES TESTED ON OUR PLATFORM

24.73%	11.77%	9.00%
The US	Poland	Saudi Arabia

5.07%	4.01%	3.72%
Canada	Brasil	The UK

11

The US is the largest international recruiter but is only the **4th** largest labor market for overseas recruitment

In our report last year, we established that certain countries like the US do a lot of external technical hiring while also being major labor pools for other countries. This year, we see that position changing noticeably. The US continues to be the largest recruiter of overseas talent in the world, but it is no longer the second-largest pool of talent. This is less a testament to the desirability of US developers and more to the increasing desirability of other countries outside the US. India, Brazil, and Egypt are becoming increasingly larger sources of overseas candidates, with the US now coming in fourth.

In fact, when you look at the top countries that the US recruits from, predictably the top three are India, Brazil, and Egypt, followed by Mexico, and Argentina. What we see is Brazil and Egypt emerging as major sources of outsourced talent. Additionally, the timezone proximity of Brazil, Mexico, and Argentina, has clearly made developers based there more attractive to US companies.

What we see is in addition to an efficient allocation of IT skills among developed economies, there is a growing importance of outsourcing-focused countries.

**THE TOP 5 COUNTRIES OVERSEAS CANDIDATES COME
FROM AND THE COUNTRIES THAT RECRUIT THEM**

1. India

1   The US

2   United Arab Emirates

3   Poland

4   The UK

5   France

2. Brazil

1   The US

2   Poland

3   Cayman Islands

4   The Netherlands

5   Canada

3. Egypt

1   The US

2   Poland

3   Austria

4   The UK

5   Saudi Arabia

4. The US

1   The UK

2   Saudi Arabia

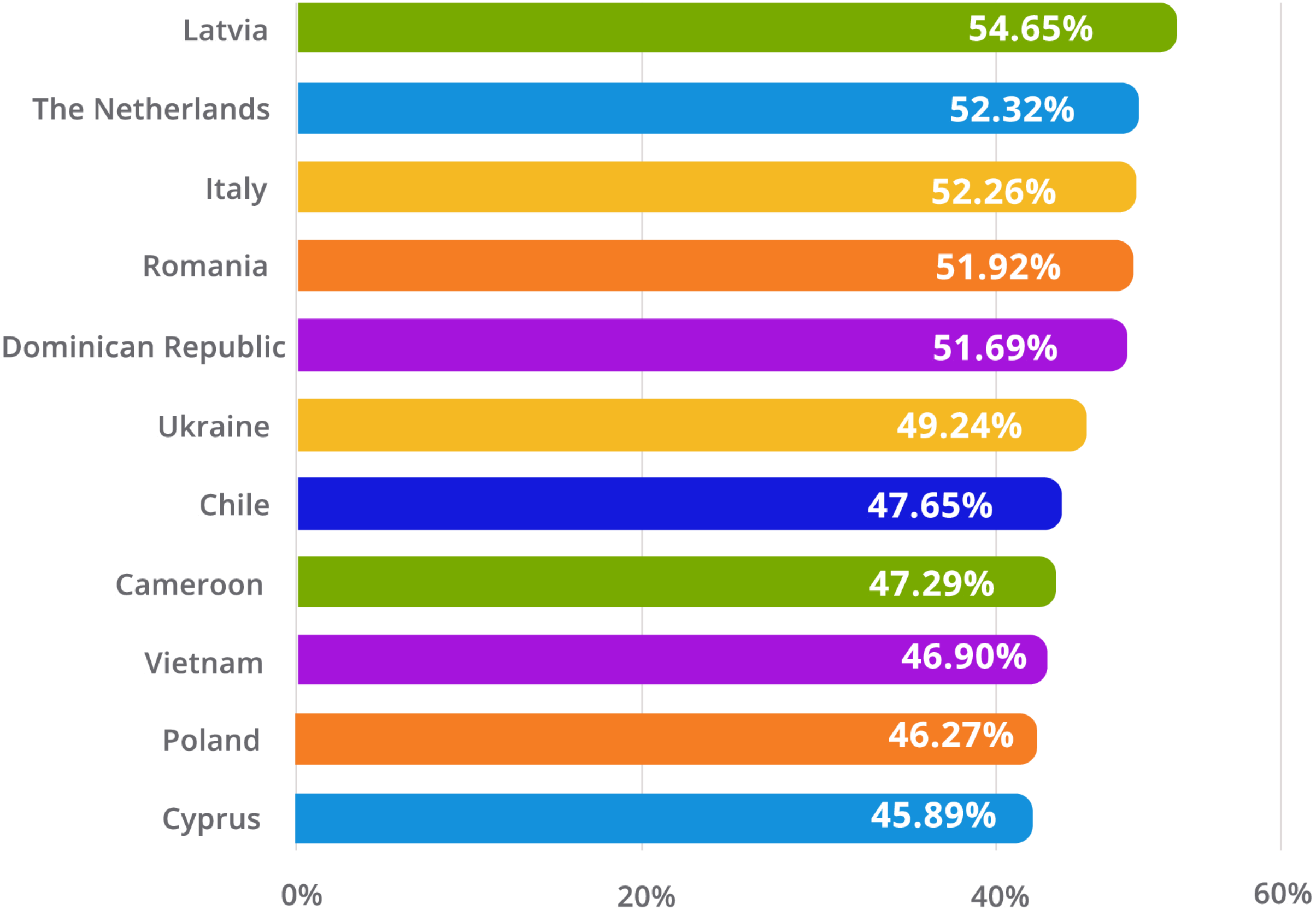3   France

4   Canada

5   Poland

5. The UK

1   The US

2   Poland

3   Ireland

4   Germany

5   Canada

12

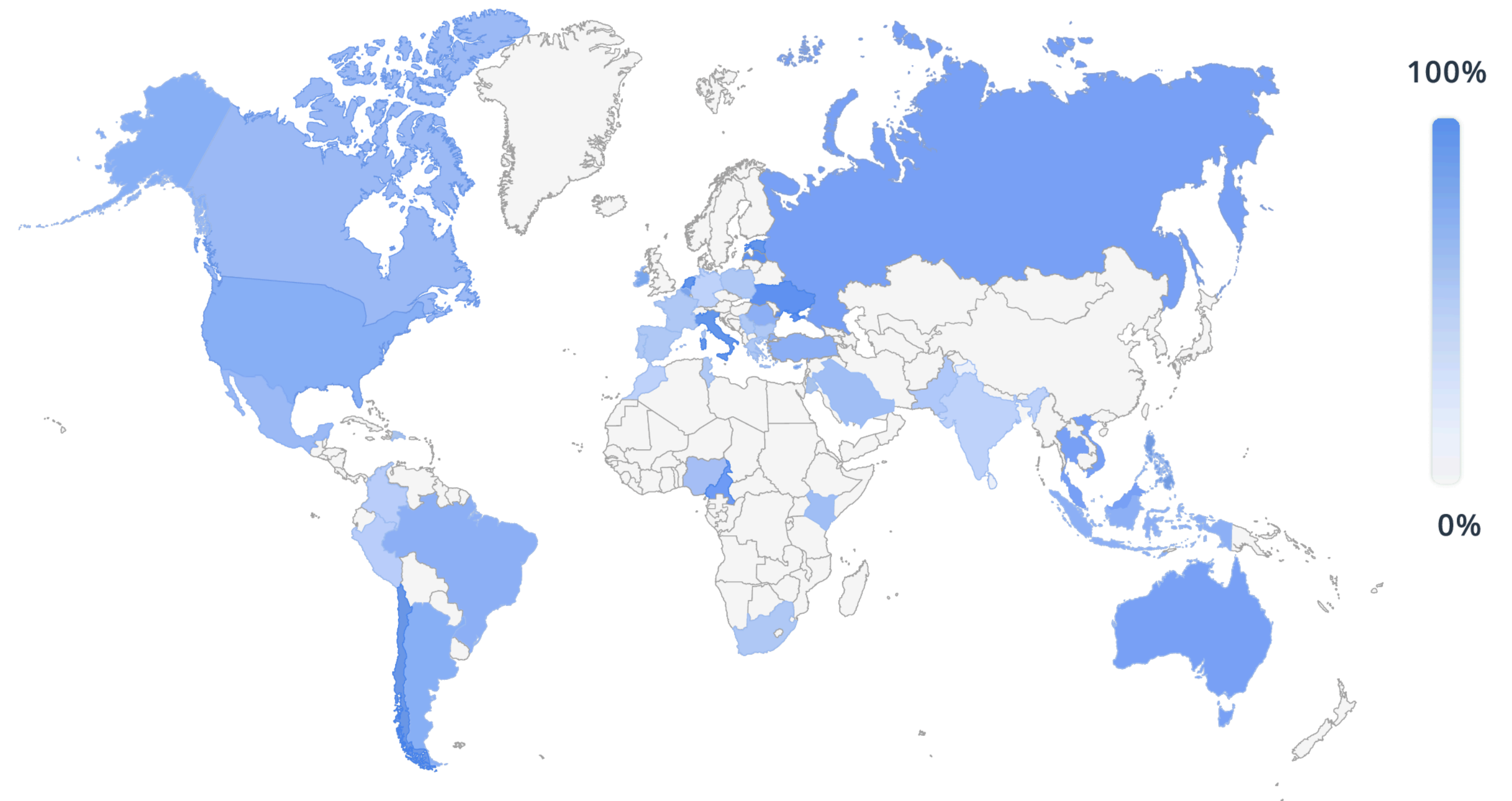# Latvian developers score the highest (**54.65%**) on coding tests

Latvian developers score the highest on coding tests with Latvian developers scoring on average 54.65%, followed closely by developers from the Netherlands and Italy.

COUNTRIES WHOSE DEVELOPERS SCORE THE HIGHEST ON CODING TESTS

Country	Score
Latvia	54.65%
The Netherlands	52.32%
Italy	52.26%
Romania	51.92%
Dominican Republic	51.69%
Ukraine	49.24%
Chile	47.65%
Cameroon	47.29%
Vietnam	46.90%
Poland	46.27%
Cyprus	45.89%

0%   20%   40%   60%

**THE PERCENTAGE OF INTERNATIONAL
TECHNICAL HIRING BY COUNTRY**

While this is a great result for the skill and quality of Latvian developers, it also suggests that coding tests are being treated differently by recruiters. Instead of trying to make coding tests incredibly difficult, recruiters are using coding tests which are a better reflection of the IT skill level required for the job. As a result, developers are scoring higher on them.

100%

0%

The explanation of why China isn't on the map can be found on page 38 →
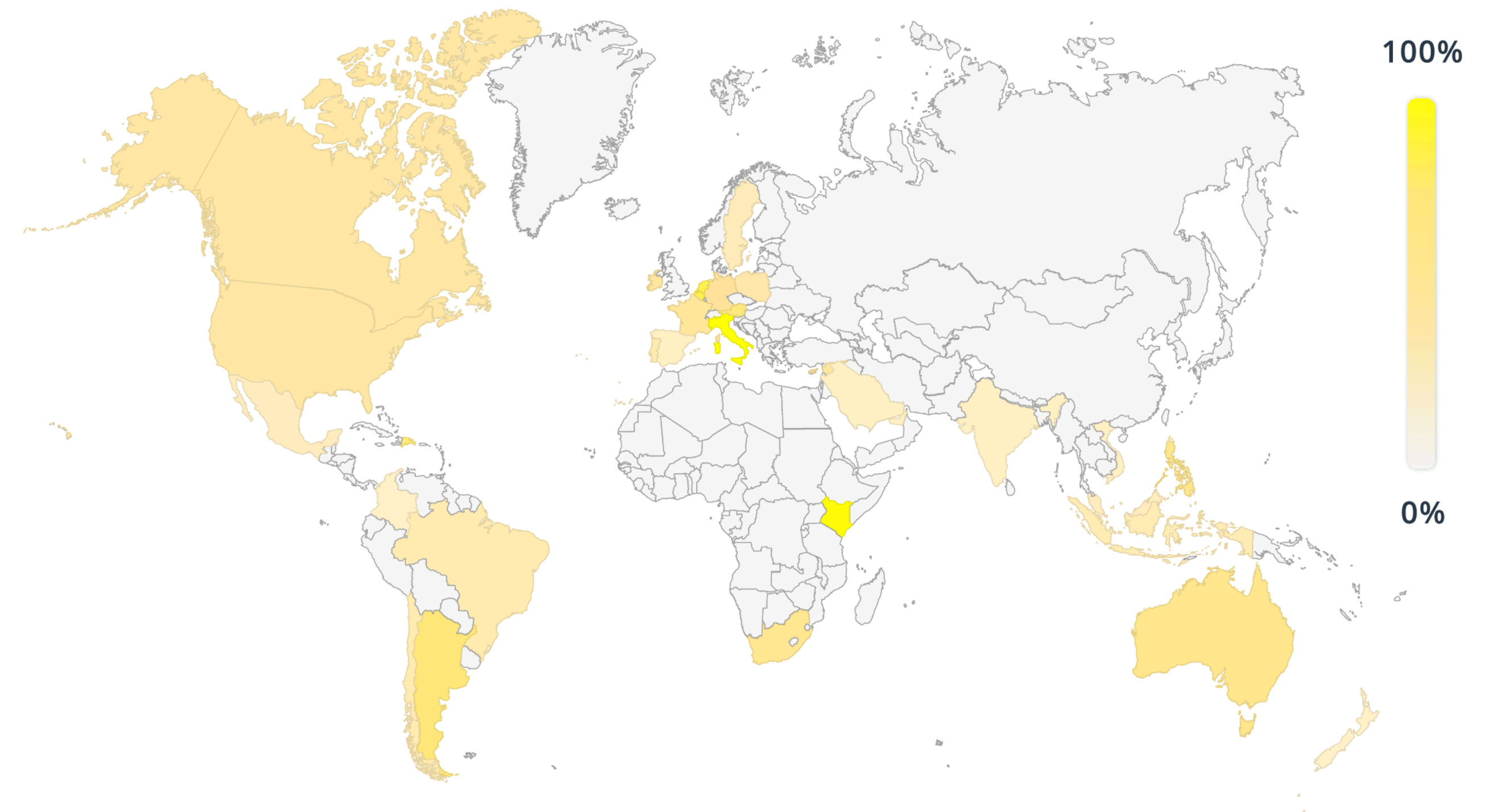
13

Italian companies have the highest scoring candidates (**57.14%**)

The average score of the candidates tested by Italian companies is 57.14%.

These results bolster the same thesis about test difficulty level we've mentioned in section 12. Italian companies are adjusting tests to be more reflective of the skill level required for the job rather than giving developers excessively challenging tests. At the same time, the country's relative wealth and small talent pool allows them to seek the best developers from around the world.

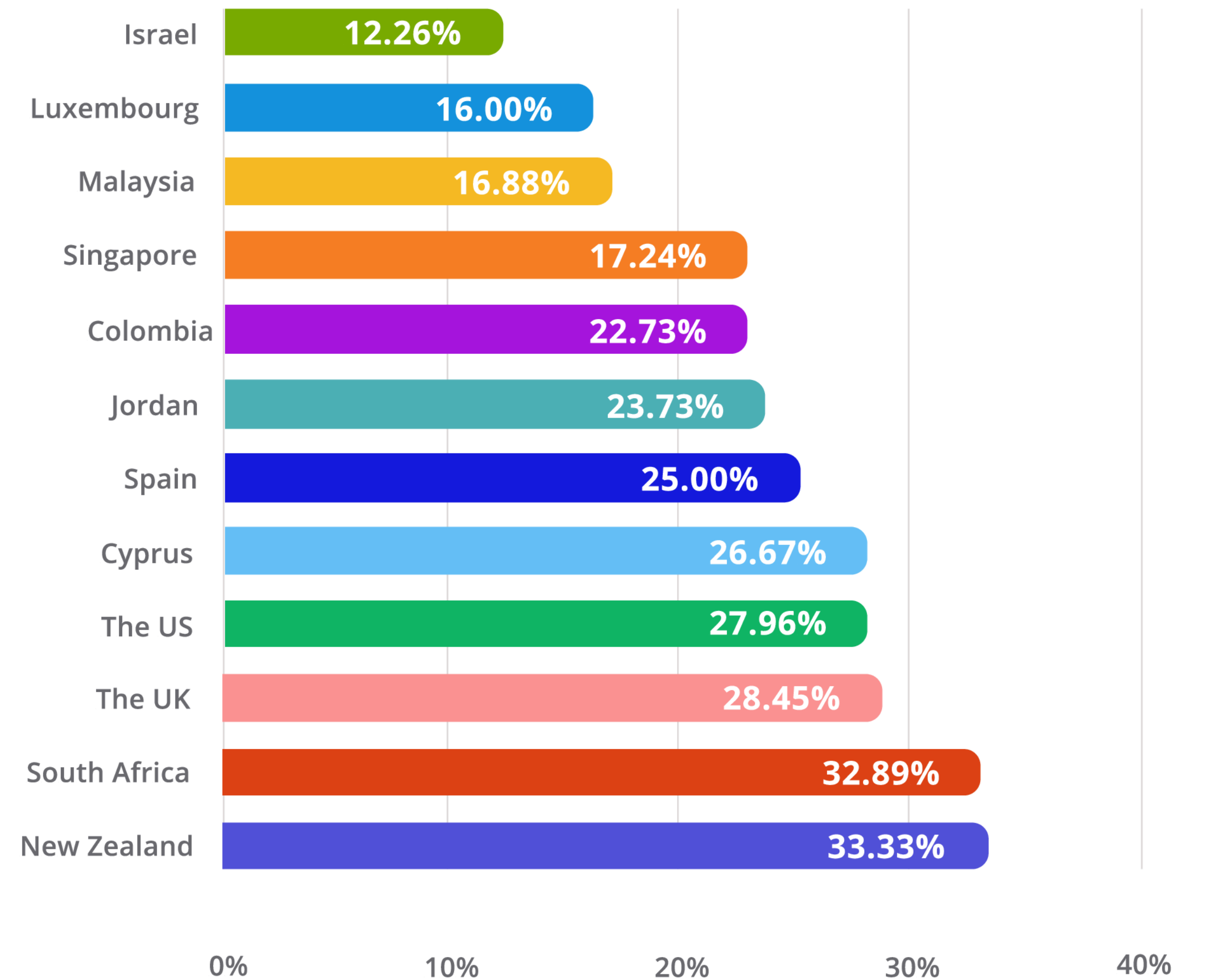**THE COUNTRIES WHOSE COMPANIES GET THE HIGHEST SCORING CANDIDATES**

100%

0%

The explanation of why China isn't on the map can be found on page 38 →

Companies from Israel are the most selective

As we've established in sections 12 and 13, companies are now targeting their tests more closely at the skill level of the positions that they are hiring for. At the same time, they are becoming much more selective. Israeli companies are the most selective this year, accepting for consideration **only 12.26% of the developers they test.**

THE PERCENTAGE OF CANDIDATES ACCEPTED BY THE RECRUITER BY COUNTRY

Country	Percentage
Israel	12.26%
Luxembourg	16.00%
Malaysia	16.88%
Singapore	17.24%
Colombia	22.73%
Jordan	23.73%
Spain	25.00%
Cyprus	26.67%
The US	27.96%
The UK	28.45%
South Africa	32.89%
New Zealand	33.33%

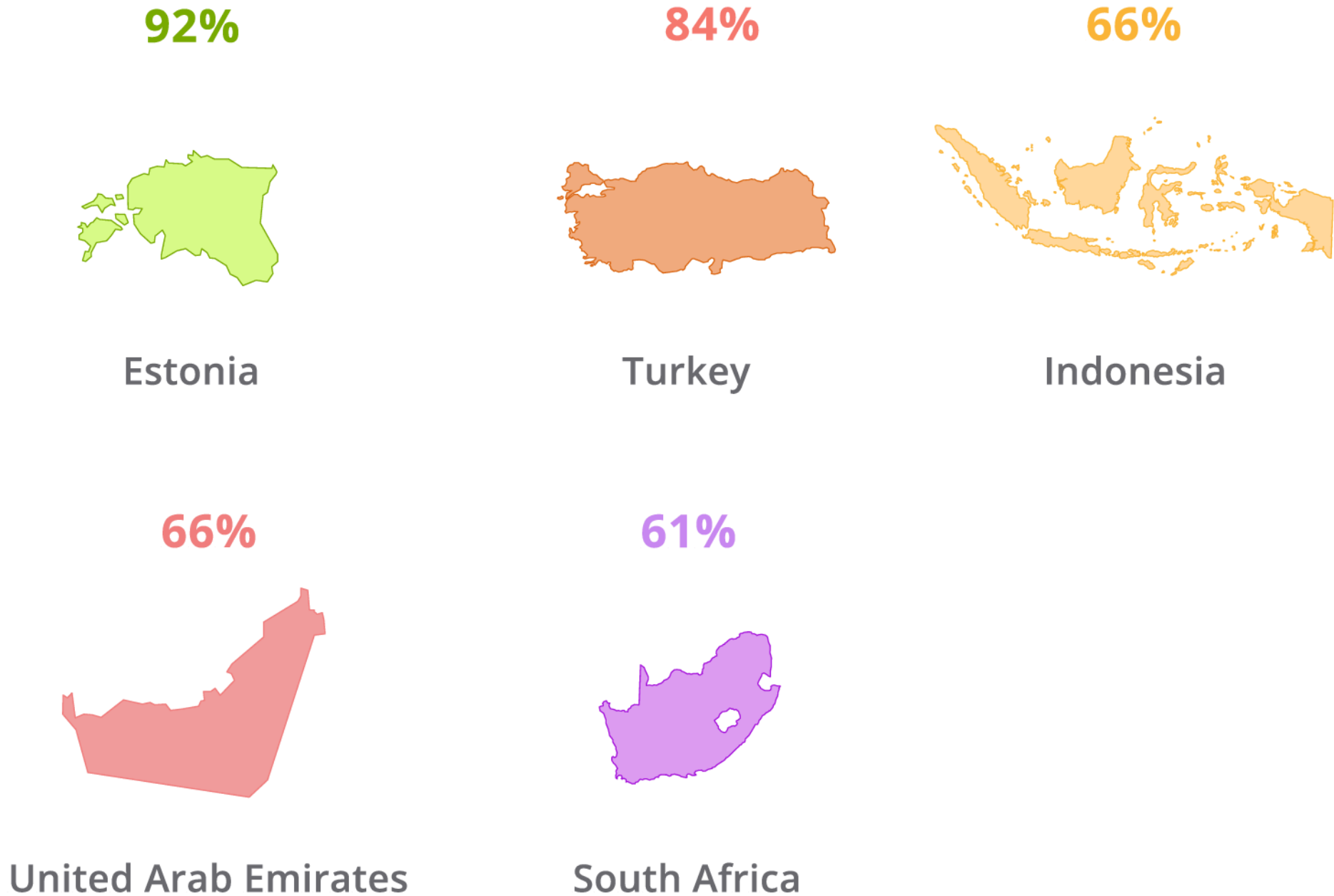That is compared to nearly **20% by Singaporean companies, who were the most selective last year.** Luxembourgian companies, who attract the highest-scoring candidates, are the second most selective. They accept for consideration only 16% of their candidates.

What this shows is that tests that are targeted at a more appropriate level are attracting many more candidates. The ability to test a wider spread of candidates has given companies the opportunity to be a lot more selective in who they accept for consideration.

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Companies are sending out coding tests to a wider section of candidates than last year

As in-stack coding tests using the **RealLifeTesting**™ methodology becomes more and more appreciated, we see more recruiters sending them to a wider range of candidates. In some countries, almost every candidate takes the test they are sent but the overall test-taking rate has gone down compared to 2019.

THE COUNTRIES WITH THE TOP UPTAKE RATES

92%

Estonia

84%

Turkey

66%

Indonesia

66%

United Arab Emirates

61%

South Africa

This reduction in the rate candidates are taking coding tests is because recruiters are becoming more comfortable with moving and automating the tech screen to the beginning of their tech recruitment process. Where last year we would have seen recruiters do a phone screen or resume screen before a coding test, more recruiters this year are becoming confident enough with the results of a DevSkiller test to make it one of the first interactions with the candidates.
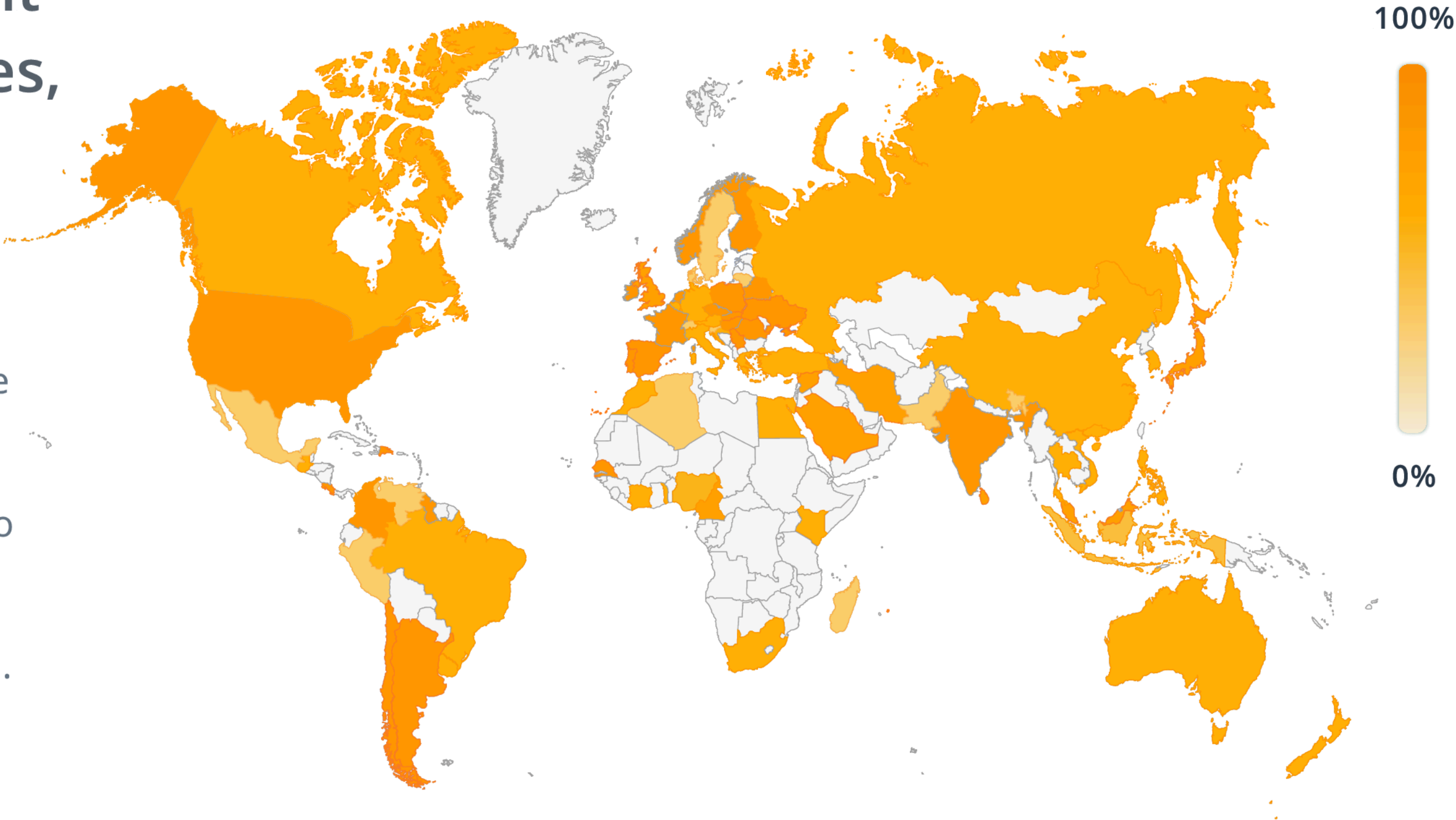
Since the candidates are less invested at this point, it makes sense that fewer would take the coding test sent to them. As a result, we've seen a drop from 73% of candidates taking the test has sent them to only 41% taking them.

Still, certain countries like Estonia still have very high rates of candidates taking the tests they are sent.

93% of developers globally finished the coding test sent to them for recruitment purposes, up from 91.9% last year

This means that when challenged with meaningful in-stack coding tests, developers are willing to devote the time it takes to complete the challenge. In-stack coding tests, like the ones found on DevSkiller, are no longer treated with the same level of suspicion developers have historically had for algorithmic tests.

THE PERCENTAGE OF DEVELOPERS WHO FINISH THEIR CODING TEST
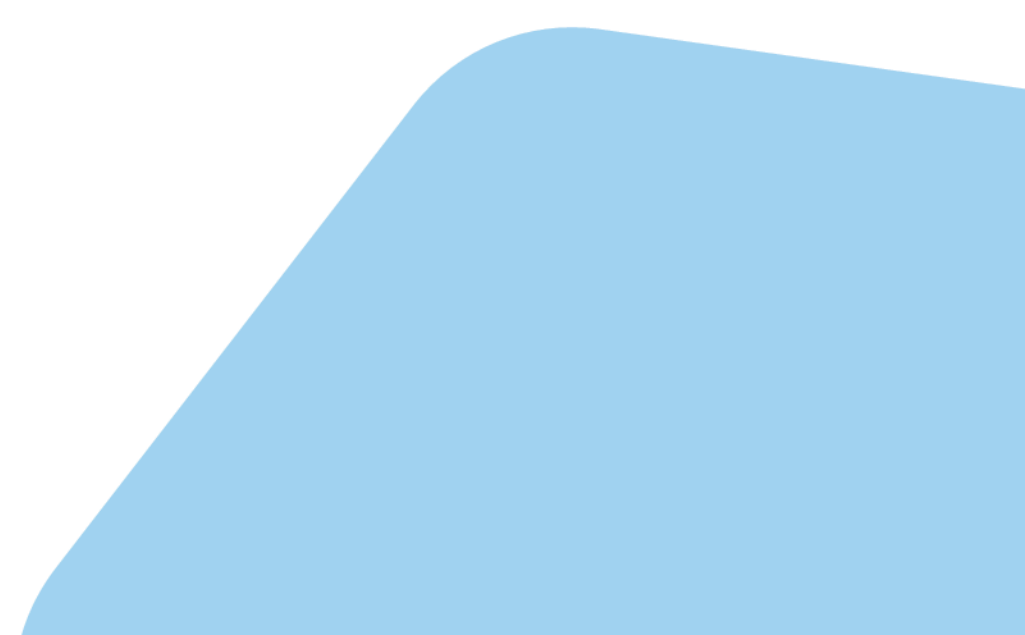

100%

0%

A full 93% of developer candidates completed the coding test they started, compared to 91.9% last year. Are there some variation among countries, though. The lowest rate came in with Madagascar (76%), which is probably more down to the state of their internet infrastructure than the displeasure that local developers have for taking these tests.

By comparison, 97% or more of the candidates from Ecuador, Bulgaria, Azerbaijan, Ghana, Kazakhstan, Uganda, Jordan, Hungary, Bosnia and Herzegovina, Latvia, the Netherlands, Ireland, Belarus, and North Macedonia completed the tests they started.

The methodology we used for this study

The data we used for this study came from a 365-day snapshot of users on our platform between December 1st, 2018 through December 1st, 2019. The insights are based on 213,782 tests taken through the DevSkiller platform by candidates in 143 countries. All data presented here is generic aggregated demographic information. It is not linked to any specific information regarding certain candidates or companies.

* In sections 1 and 2 the percentages don't add up to 100%. Why is that?

Section 1

A DevSkiller test can include multiple technologies. For instance, you could have a test in Java and a test in Java+SQL. In this sample, 100% of the tests test Java and 50% of the tests test SQL. In the same way, the percentage in the chart refers to when the technology is tested in any test.

Section 2

Similar to section 1, a company might test developers in multiple technologies. To make it clearer, let's look at a group of two companies. The first company sends out a JavaScript+CSS test. The second company sends out a PHP+JavaScript test. In this group, 100% of the companies test JavaScript, 50% test CSS, and 50% test PHP. The percentage in the chart refers to when the technology is used in any test by a company.

*In sections 12 and 13, why isn't China on the map?

We don't have a lot of data about mainland China so while we included the countries that send invites to mainland Chinese developers in the interactive map, we eliminated China and other countries where we had a small sample size from our maps in **sections 12 and 13**.

Do you have any questions or comments about the report?

We'd love to hear them. You can get in touch with us by emailing **research@devskiller.com**

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