

---

```
,trigger:"hover
focus",title:"",delay:0,html:!1,container:!1,viewport:{selector:"body",padding:0},c.prototype
document.constructor&&!this.options.selector)throw new Error("`selector` option
must be specified when initializing "+this.type+" on the window.document
object!");for(var e=this.options.trigger.split(" "),f=e.length;f--;){var
g=e[f];if("click"==g)this.$element.on("click."+this.type,this.options.selector,a.proxy(this.toggle,
if("manual"!=g){var
h="hover"==g?"mouseenter":"focusin",i="hover"==g?"mouseleave":"focusout";this.$element
c.DEFAULTS},c.prototype.getOptions=function(b){return
b=a.extend({},this.getDefaults(),this.$element.data(),b),b.delay&&"number"==typeof
b.delay&&(b.delay={show:b.delay,hide:b.delay}),b},c.prototype.getDelegateOptions=function(
b={},c=this.getDefaults());return
this._options&&a.each(this._options,function(a,d){c[a]!=d&&(b[a]=d)}),b},c.prototype.enter:
c=b instanceof this.constructor?b:a(b.currentTarget).data("bs."+this.type);return
c||(c=new
this.constructor(b.currentTarget,this.getDelegateOptions()),a(b.currentTarget).data("bs."+this
instanceof
a.Event&&(c.inState["focusin"==b.type?"focus":"hover"]!=0),c.tip().hasClass("in")||"in"==c.in
a in
this.inState)if(this.inState[a])return!0;return!1},c.prototype.leave=function(b){var
c=b instanceof this.constructor?b:a(b.currentTarget).data("bs."+this.type);return
c||(c=new
this.constructor(b.currentTarget,this.getDelegateOptions()),a(b.currentTarget).data("bs."+this
instanceof
a.Event&&(c.inState["focusout"==b.type?"focus":"hover"]!=1),c.isInStateTrue()?void
0:(clearTimeout(c.timeout),c.hoverState="out",c.options.delay&&c.options.delay.hide?void
b=a.Event("show.bs."+this.type);if(this.hasContent()&&this.enabled){this.$element.trigger(
d=a.contains(this.$element[0].ownerDocument.documentElement,this.$element[0]);if(b.isD
e=this,f=this.tip(),g=this.getUID(this.type);this.setContent(),f.attr("id",g),this.$element.attr("
describedby",g),this.options.animation&&f.addClass("fade");var
h="function"==typeof
this.options.placement?this.options.placement.call(this,f[0],this.$element[0]):this.options.p
k=this.getPosition(),l=f[0].offsetWidth,m=f[0].offsetHeight;if(j){var
```

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n=h,o=this.getPosition(this.$viewport);h="bottom"==h&&k.bottom+m>o.bottom?"top":"top"
mo.width?"left":"left"==h&&k.left-lg.top+g.height&&(e.top=g.top+g.height-
i)}else{var j=b.left-f,k=b.left+f+c;jg.right&&(e.left=g.left+g.width-k)}return
e},c.prototype.getTitle=function(){var a,b=this.$element,c=this.options;return
a=b.attr("data-original-title")||("function"==typeof
c.title?c.title.call(b[0]):c.title)},c.prototype.getUID=function(a){do
a+=~~(1e6*Math.random());while(document.getElementById(a));return
a},c.prototype.tip=function(){if(!this.$tip&&(this.$tip=a(this.options.template),1!=this.$tip.ler
new Error(this.type+" `template` option must consist of exactly 1 top-level
element!"));return this.$tip},c.prototype.arrow=function(){return
this.$arrow=this.$arrow||this.tip().find(".tooltip-
arrow")},c.prototype.enable=function(){this.enabled=!0},c.prototype.disable=function(){this
c=this;b&&(c=a(b.currentTarget).data("bs."+this.type),c||(c=new
this.constructor(b.currentTarget,this.getDelegateOptions()),a(b.currentTarget).data("bs."+t
a=this;clearTimeout(this.timeout),this.hide(function(){a.$element.off("."+a.type).removeData
d=a.fn.tooltip;a.fn.tooltip=b,a.fn.tooltip.Constructor=c,a.fn.tooltip.noConflict=function(){retu
a.fn.tooltip=d,this}}(jQuery),+function(a){"use strict";function b(b){return
this.each(function(){var d=a(this),e=d.data("bs.popover"),f="object"==typeof
b&&b;(e||!/destroy|hide/.test(b))&&(e||d.data("bs.popover",e=new
c(this,f)),"string"==typeof b&&e[b]())}})var
c=function(a,b){this.init("popover",a,b)};if(!a.fn.tooltip)throw new Error("Popover
requires
tooltip.js");c.VERSION="3.3.5",c.DEFAULTS=a.extend({},a.fn.tooltip.Constructor.DEFAULTS
'),c.prototype=a.extend({},a.fn.tooltip.Constructor.prototype),c.prototype.constructor=c,c.p
c.DEFAULTS},c.prototype.setContent=function(){var
a=this.tip(),b=this.getTitle(),c=this.getContent();a.find(".popover-
title")[this.options.html?"html":"text"](b),a.find(".popover-
content").children().detach().end()[this.options.html?"string"==typeof
c?"html":"append":"text"](c),a.removeClass("fade top bottom left right
in"),a.find(".popover-title").html()||a.find(".popover-
title").hide()},c.prototype.hasContent=function(){return
this.getTitle()||this.getContent()},c.prototype.getContent=function(){var
a=this.$element,b=this.options;return a.attr("data-content")||("function"==typeof
b.content?b.content.call(a[0]):b.content)},c.prototype.arrow=function(){return
```

```
this.$arrow=this.$arrow||this.tip().find(".arrow");var
d=a.fn.popover;a.fn.popover=b,a.fn.popover.Constructor=c,a.fn.popover.noConflict=function()
a.fn.popover=d,this}}(jQuery),+function(a){"use strict";function
b(c,d){this.$body=a(document.body),this.$scrollElement=a(a(c).is(document.body)?window
.nav li >
a",this.offsets=[],this.targets=[],this.activeTarget=null,this.scrollHeight=0,this.$scrollElement
c(c){return this.each(function(){var
d=a(this),e=d.data("bs.scrollspy"),f="object"===typeof
c&&c;e||d.data("bs.scrollspy",e=new b(this,f)),"string"===typeof
c&&e[c]()}}b.VERSION="3.3.5",b.DEFAULTS={offset:10},b.prototype.getScrollHeight=function()
this.$scrollElement[0].scrollHeight||Math.max(this.$body[0].scrollHeight,document.docume
b=this,c="offset",d=0;this.offsets=[],this.targets=[],this.scrollHeight=this.getScrollHeight(),a
b=a(this),e=b.data("target")||b.attr("href"),f=/^#./.test(e)&&a(e);return
f&&f.length&&f.is(":visible")&&[[f[c]().top+d,e]]||null}).sort(function(a,b){return a[0]-
b[0]}).each(function(){b.offsets.push(this[0]),b.targets.push(this[1])}),b.prototype.process=
a,b=this.$scrollElement.scrollTop()+this.options.offset,c=this.getScrollHeight(),d=this.optio
this.$scrollElement.height(),e=this.offsets,f=this.targets,g=this.activeTarget;if(this.scrollHei
g!=(a=f[f.length-1])&&this.activate(a);if(g&&b=e[a]&&(void 0===e[a+1])||b
.dropdown-menu > .active").removeClass("active").end().find('[data-
toggle="tab"]').attr("aria-expanded",!1),b.addClass("active").find('[data-
toggle="tab"]').attr("aria-
expanded",!0),h?(b[0].offsetWidth,b.addClass("in")):b.removeClass("fade"),b.parent(".drop
menu").length&&b.closest("li.dropdown").addClass("active").end().find('[data-
toggle="tab"]').attr("aria-expanded",!0),e&&e()}}var g=d.find(">
.active"),h=e&&a.support.transition&&(g.length&&g.hasClass("fade"))?!d.find(">
.fade").length);g.length&&h?g.one("bsTransitionEnd",f).emulateTransitionEnd(c.TRANSIT
d=a.fn.tab;a.fn.tab=b,a.fn.tab.Constructor=c,a.fn.tab.noConflict=function(){return
a.fn.tab=d,this};var
e=function(c){c.preventDefault(),b.call(a(this),"show");a(document).on("click.bs.tab.data-
api",[data-toggle="tab"],e).on("click.bs.tab.data-api",[data-
toggle="pill"],e)}(jQuery),+function(a){"use strict";function b(b){return
this.each(function(){var d=a(this),e=d.data("bs.affix"),f="object"===typeof
b&&b;e||d.data("bs.affix",e=new c(this,f)),"string"===typeof b&&e[b]()}}var
c=function(b,d){this.options=a.extend({},c.DEFAULTS,d),this.$target=a(this.options.target),
```

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api",a.proxy(this.checkPosition,this)).on("click.bs.affix.data-
api",a.proxy(this.checkPositionWithEventLoop,this)),this.$element=a(b),this.affixed=null,th
affix-top affix-
bottom",c.DEFAULTS={offset:0,target:window},c.prototype.getState=function(a,b,c,d){var
e=this.$target.scrollTop(),f=this.$element.offset(),g=this.$target.height();if(null!=c&&"top"=
c>e?"top":!1;if("bottom"==this.affixed)return
null!=c?e+this.unpin<=f.top?!1:"bottom":a-d>=e+g?!1:"bottom";var
h=null==this.affixed,i=h?e:f.top,j=h?g:b;return
null!=c&&c>=e?"top":null!=d&&i+j>=a-
d?"bottom":!1},c.prototype.getPinnedOffset=function(){if(this.pinnedOffset)return
this.pinnedOffset;this.$element.removeClass(c.RESET).addClass("affix");var
a=this.$target.scrollTop(),b=this.$element.offset();return this.pinnedOffset=b.top-
a},c.prototype.checkPositionWithEventLoop=function(){setTimeout(a.proxy(this.checkPosi
b=this.$element.height(),d=this.options.offset,e=d.top,f=d.bottom,g=Math.max(a(document
d&&(f=e=d),"function"==typeof e&&(e=d.top(this.$element))),"function"==typeof
f&&(f=d.bottom(this.$element)));var
h=this.getState(g,b,e,f);if(this.affixed!=h){null!=this.unpin&&this.$element.css("top","");var
i="affix"+(h?"-
"+h:""),j=a.Event(i+".bs.affix");if(this.$element.trigger(j),j.isDefaultPrevented())return;this.aff
b-f)}});var
d=a.fn.affix;a.fn.affix=b,a.fn.affix.Constructor=c,a.fn.affix.noConflict=function(){return
a.fn.affix=d,this},a(window).on("load",function(){a("[data-
spy="affix"]').each(function(){var
c=a(this),d=c.data();d.offset=d.offset||{},null!=d.offsetBottom&&(d.offset.bottom=d.offsetBo

```

```

'); $(tabs[0]).before(tabContent); // build the tabset var activeTab = 0;
tabs.each(function(i) { // get the tab div var tab = $(tabs[i]); // get the id then sanitize it
for use with bootstrap tabs var id = tab.attr('id'); // see if this is marked as the active
tab if (tab.hasClass('active')) activeTab = i; // remove any table of contents entries
associated with // this ID (since we'll be removing the heading element) $("div#" +
toCID + " li a[href='#" + id + "']").parent().remove(); // sanitize the id for use with
bootstrap tabs id = id.replace(/[\.\V?&!#<>]/g, "").replace(/\s/g, '_'); tab.attr('id', id); // get
the heading element within it, grab it's text, then remove it var heading = tab.find('h' +
tabLevel + ':first'); var headingText = heading.html(); heading.remove(); // build and
append the tab list item var a = $("<li> + headingText + "); a.attr('href', '#' + id); a.attr('aria-

```

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controls', id); var li = $('
• '); li.append(a); tabList.append(li); // set it's attributes tab.attr('role', 'tabpanel');
tab.addClass('tab-pane'); tab.addClass('tabbed-pane'); if (fade) tab.addClass('fade'); //
move it into the tab content div tab.detach().appendTo(tabContent); }); // set active tab
$(tabList.children('li')[activeTab]).addClass('active'); var active =
$(tabContent.children('div.section')[activeTab]); active.addClass('active'); if (fade)
active.addClass('in'); if (tabset.hasClass("tabset-sticky"))
tabset.rmarkdownStickyTabs(); } // convert section divs with the .tabset class to
tabsets var tabsets = $("div.section.tabset"); tabsets.each(function(i) {
buildTabset($(tabsets[i])); }); };
```



## COVID-19 Genomics Bulletin

13 November 2024

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- [2 Current Variant View - last 8 weeks](#)
- [3 Variant View - last 12 months](#)
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This report describes the epidemiology of SARS-CoV-2 (the virus that causes COVID-19) variants in Northern Ireland.

The availability of SARS-CoV-2 sequencing results is affected the current COVID-19 testing policy and practice. We continue to monitor the circulating lineages detected through clinical testing and community sentinel surveillance for changes in prevalence of genomic variants and emergence of novel variants. We use intelligence from UKHSA and other public health authorities to monitor prevalence of mutations that may be associated with changes in immunity or severity.

It should be noted that date ranges in this report are different from those reported in the Respiratory Surveillance Report, available [here](#).

Grouping of lineages into their parent lineages is subject to change, as variant definitions and lineages under monitoring are revised.

## 1 Summary

- In the 8 epidemiological weeks (02 September 2024 to 22 October 2024), 265 COVID-19 samples were sequenced in Northern Ireland.
- The current most common SARS-CoV-2 variant in Northern Ireland is KP.3 (V-23DEC-01), with 37 sequenced samples, or 90.2% of all sequenced samples (100% of those with a lineage assigned) in the week commencing 14 October 2024.
- More information about prevalence and growth rates of SARS-CoV-2 lineages circulating in the UK can be found in UKHSA reports published [here](#).

## 2 Current Variant View - last 8 weeks

This section summarises the SARS-CoV-2 sequencing data for Northern Ireland for the last 8 weeks of sequencing data available (02 September 2024 to 22 October 2024).

In the last 8 weeks of sequencing data, the following parent lineages have been detected: KP.3, XEC, KP, JN.1, BA.2, and BA.3. The number of sequenced samples can be seen in Table 2.1 and Figure 2.1, and the numbers as a percentage of total sequenced samples are shown in Figure 2.2. The age group distribution by parent lineage is shown in Figure 2.3.

*Please note that numbers of sequenced samples per week may change retrospectively due to the delay in sequencing.*

*Recombinant refers to any lineage starting with “X” that does not fall under any other parent lineage definition.*

| <b>Table 2.1. Number (Percentage) of sequenced samples for</b> |                   |                   |                   |
|----------------------------------------------------------------|-------------------|-------------------|-------------------|
| <b>Variant (parent lineage)</b>                                | <b>2024-09-02</b> | <b>2024-09-09</b> | <b>2024-09-16</b> |
| <b>Unassigned (Unassigned)</b>                                 | <b>1 (3.6%)</b>   | <b>5 (20.8%)</b>  | <b>4 (8.9%)</b>   |
| <b>V-23DEC-01 (JN.1)</b>                                       | <b>1 (3.6%)</b>   | <b>1 (4.2%)</b>   | <b>1 (2.2%)</b>   |
| <b>V-23DEC-01 (KP)</b>                                         | <b>2 (7.1%)</b>   | <b>2 (8.3%)</b>   | <b>0 (0)</b>      |
| <b>V-23DEC-01 (KP.3)</b>                                       | <b>19 (67.9%)</b> | <b>11 (45.8%)</b> | <b>32 (71.1%)</b> |
| <b>V-23DEC-01 (XEC)</b>                                        | <b>4 (14.3%)</b>  | <b>4 (16.7%)</b>  | <b>7 (15.6%)</b>  |
| <b>VOC-22JAN-01 (BA.2)</b>                                     | <b>1 (3.6%)</b>   | <b>0 (0)</b>      | <b>1 (2.2%)</b>   |
| <b>VOC-21NOV-01 (BA.3)</b>                                     | <b>0 (0)</b>      | <b>1 (4.2%)</b>   | <b>0 (0)</b>      |
| <b>Week Total</b>                                              | <b>28</b>         | <b>24</b>         | <b>45</b>         |

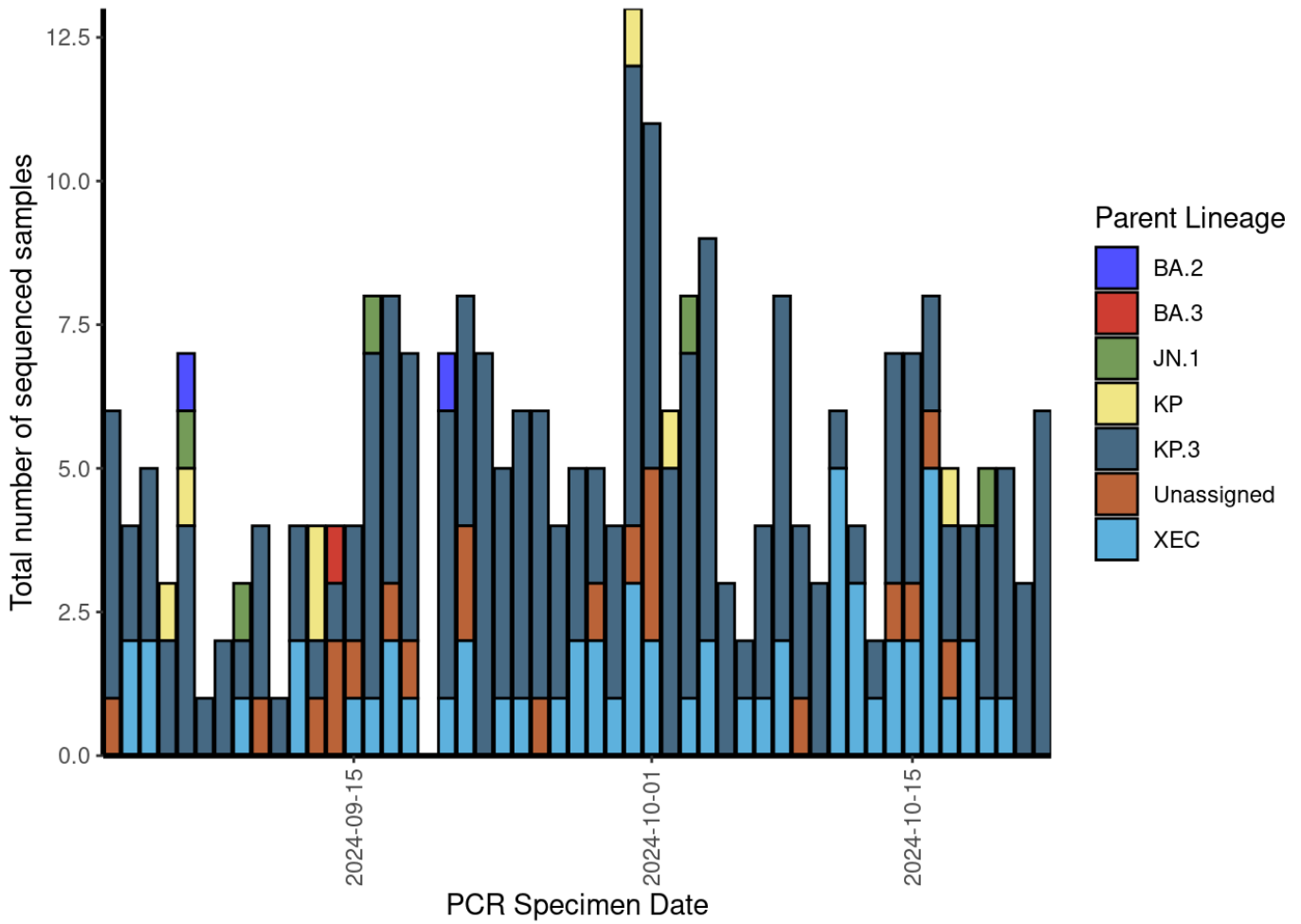


Figure 2.1: Sequenced COVID-19 cases in Northern Ireland, by parent lineage and day, for the last 8 weeks of sequencing data



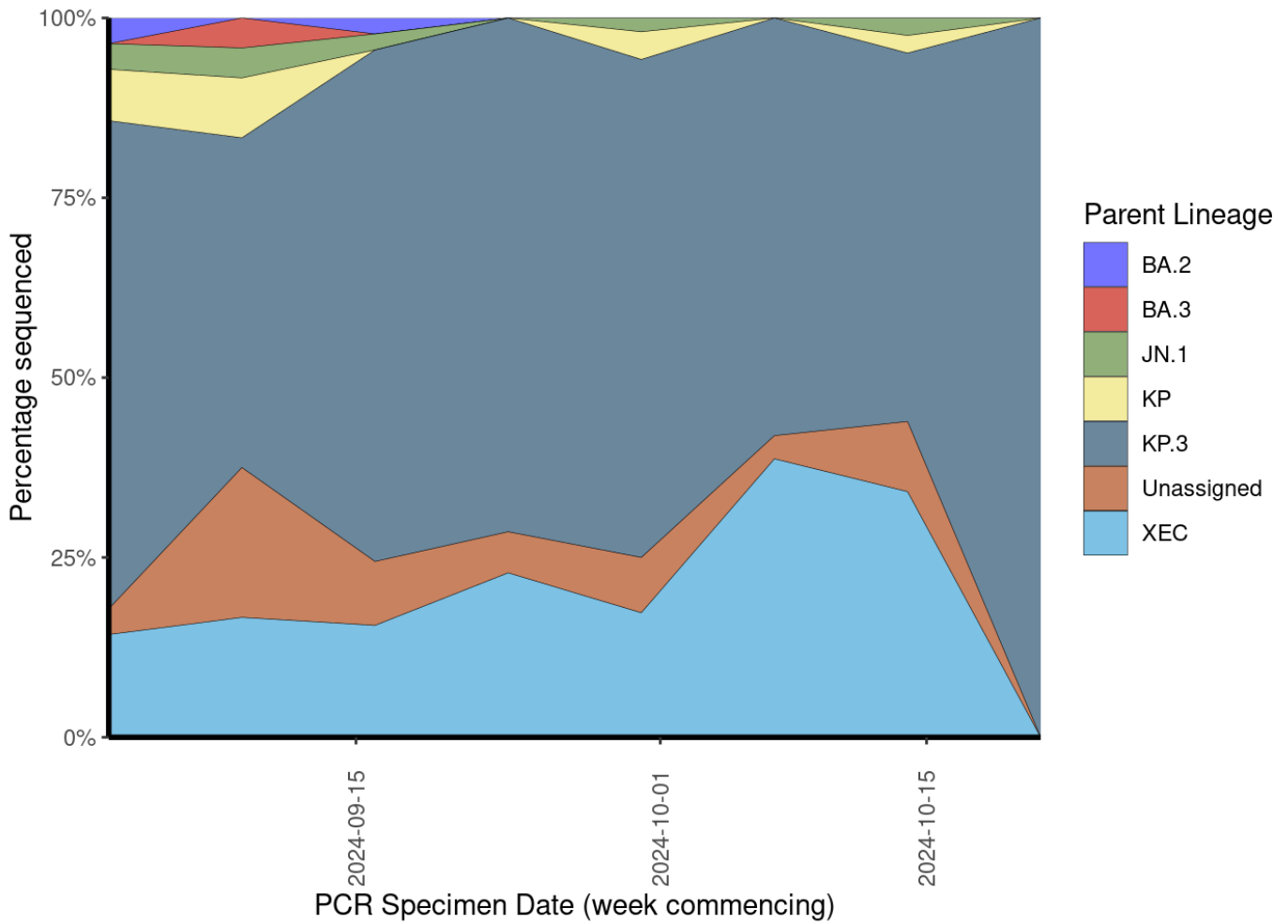


Figure 2.2: Percentage of sequenced COVID-19 cases in Northern Ireland, by variant and epidemiological week, for the last 8 weeks of sequencing data

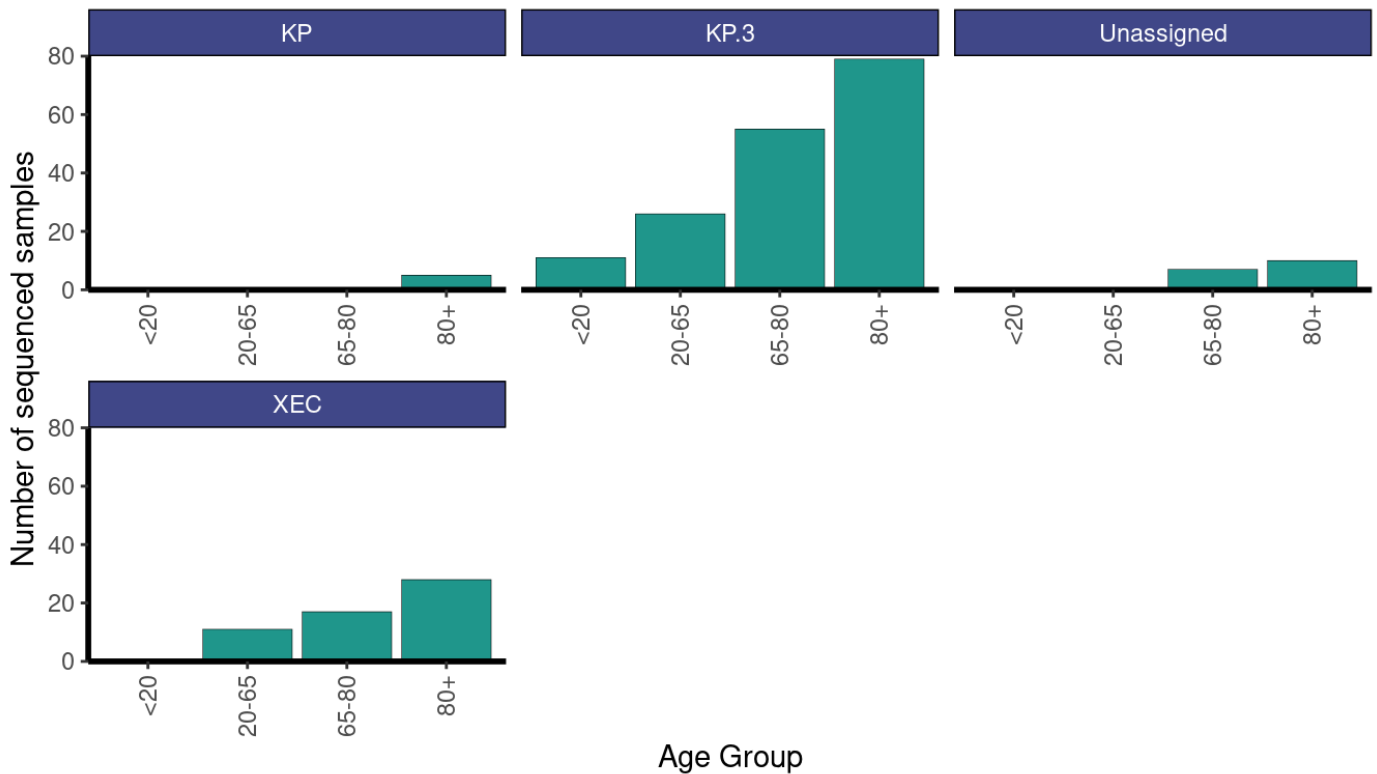


Figure 2.3: Total number of sequenced COVID-19 samples in Northern Ireland by age group, faceted by parent lineage over the last 8 weeks of sequencing data

*This chart only shows counts for lineages with at least 5 sequenced samples in a given age group.*

*Age band information is not available for all sequences, so age band distributions should be interpreted with caution.*

### 3 Variant View - last 12 months

This section summarises the COVID-19 sequencing data for Northern Ireland over the past 12 months (22 October 2023 to 22 October 2024).

The number of sequenced samples over the past 12 months can be seen in Figure 3.1 and supplementary Table 6.2, and the numbers as a percentage of total sequenced samples are shown in Figure 3.2. The age-sex distribution by parent lineages is shown in Figure 3.3.

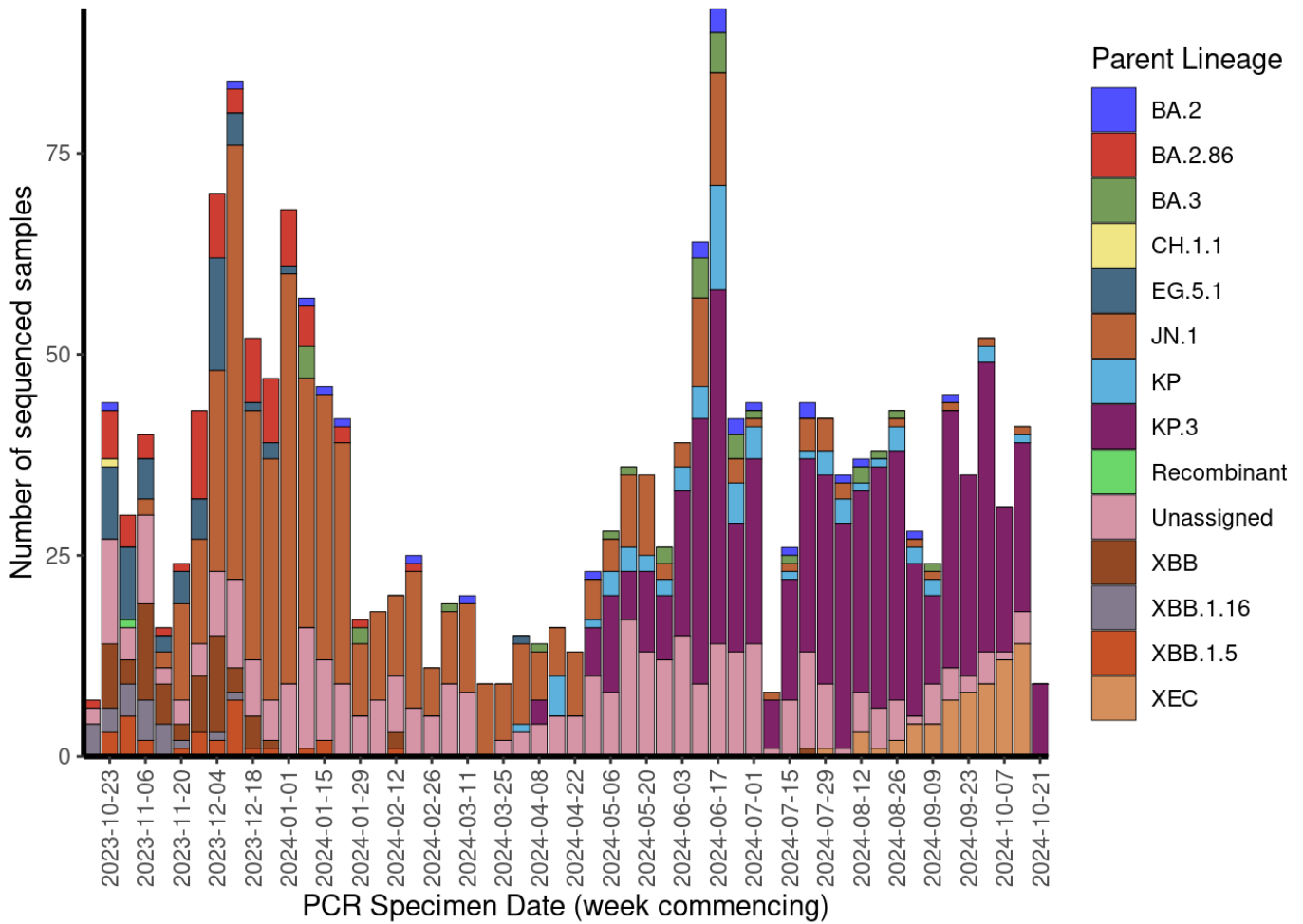


Figure 3.1: Sequenced COVID-19 cases in Northern Ireland, by variant and epidemiological week for the last 12 months

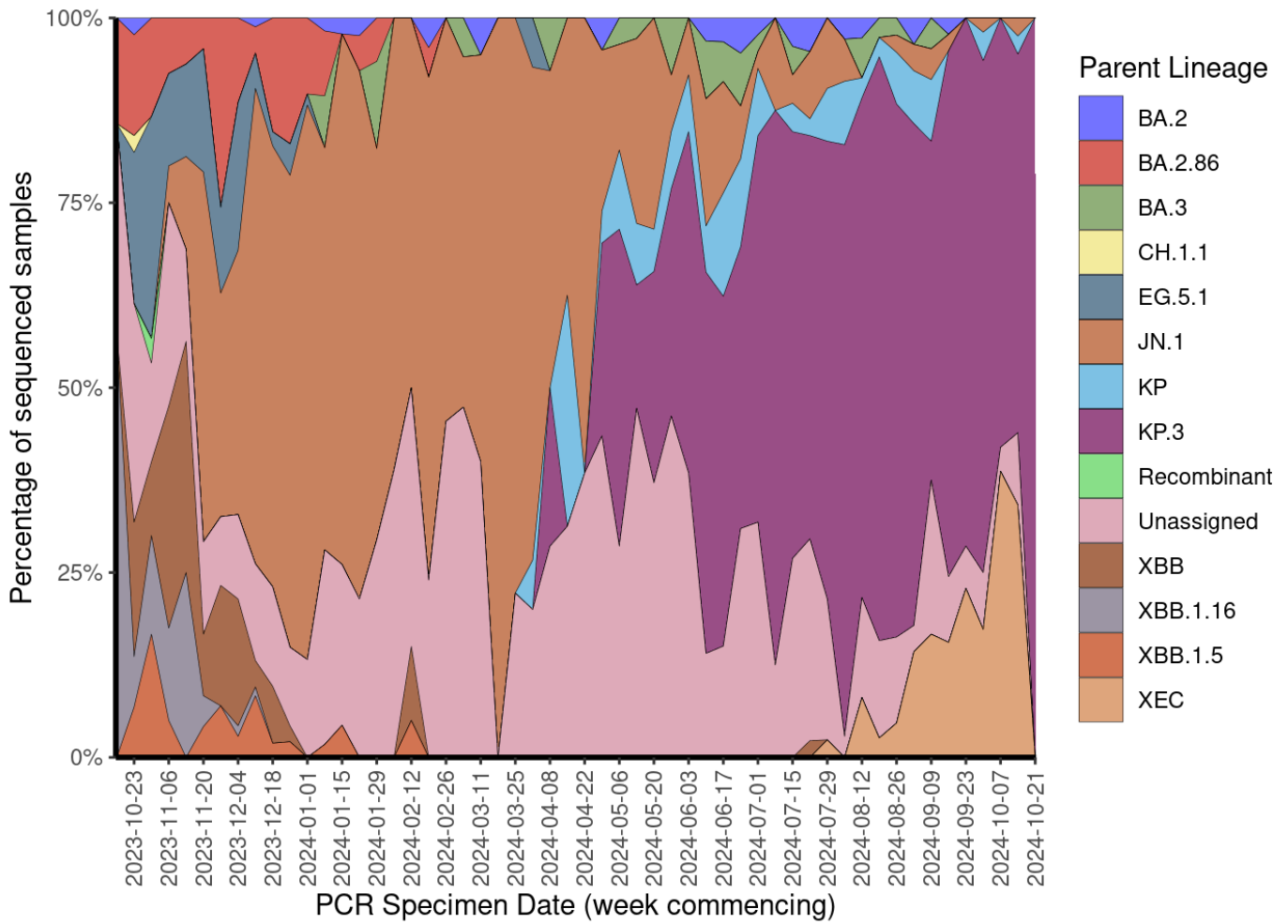


Figure 3.2: Percentage of sequenced COVID-19 samples in Northern Ireland by epidemiological week for the last 12 months

Sex Female Male

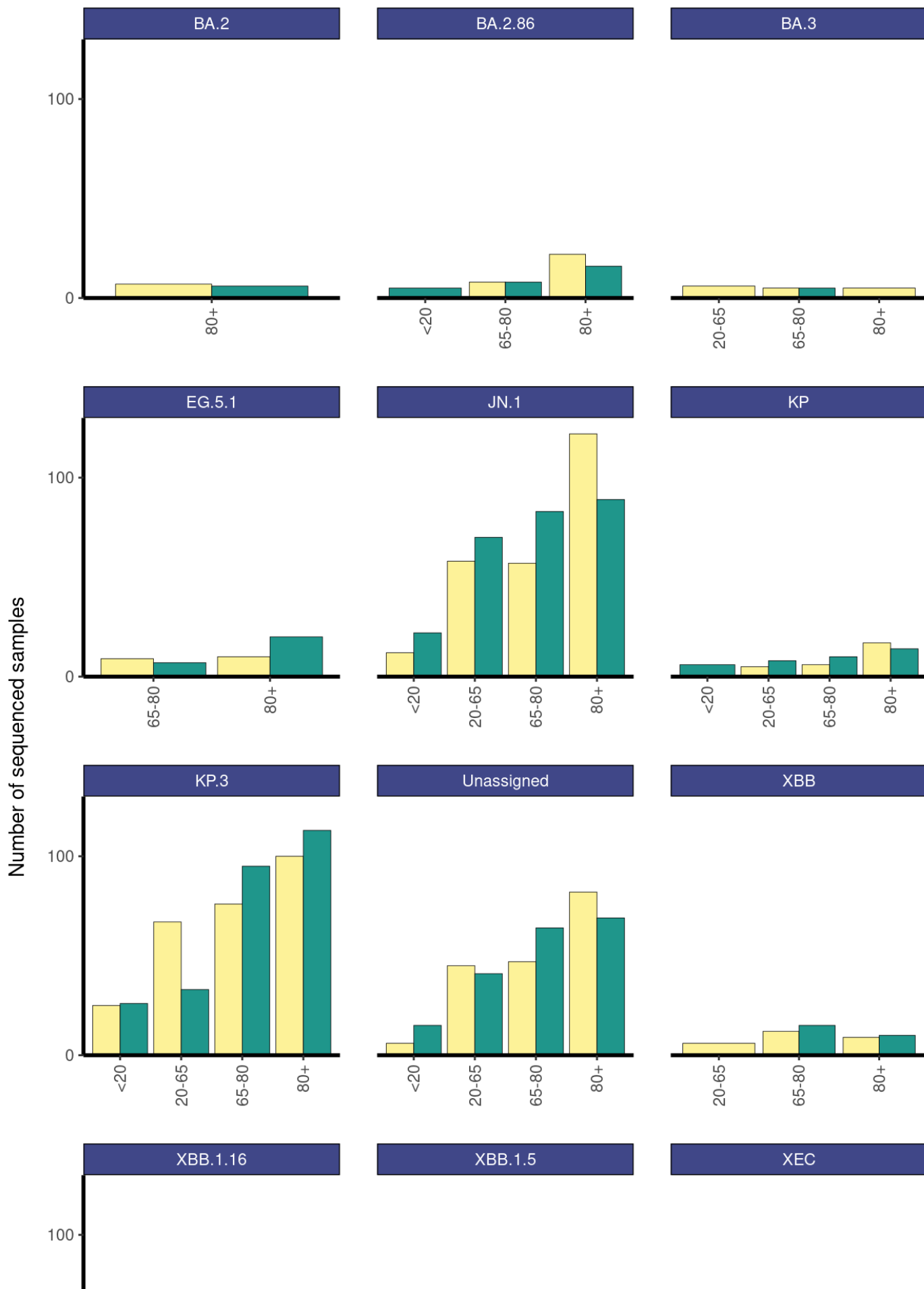


Figure 3.3: Total number of sequenced COVID-19 samples in Northern Ireland by age group and sex, by parent lineage over the last 12 months

*This chart only shows counts for lineages with at least 5 sequenced samples in a given age group.*

## 4 Percentage of Specimens Sequenced

Not all PCR samples are sequenced; sequencing can only be carried out on samples that have a sufficiently high viral load, which is largely determined by when the sample is taken during the course of the infection. Other factors affecting how many samples are sequenced include volume of sample available, sample quality, and sequencing laboratory capacity.

The number of COVID-19 positive PCR samples (sequenced and not sequenced) in Northern Ireland over the past 12 months (16 October 2023 to 21 October 2024) is shown in Figure 4.1. The percentage of COVID-19 positive PCR samples that have been sequenced in on a weekly basis over the past 12 months is shown in Figure 4.2, with 16.67% sequenced (4 week rolling average of 18.63%) in the week commencing 21 October 2024.

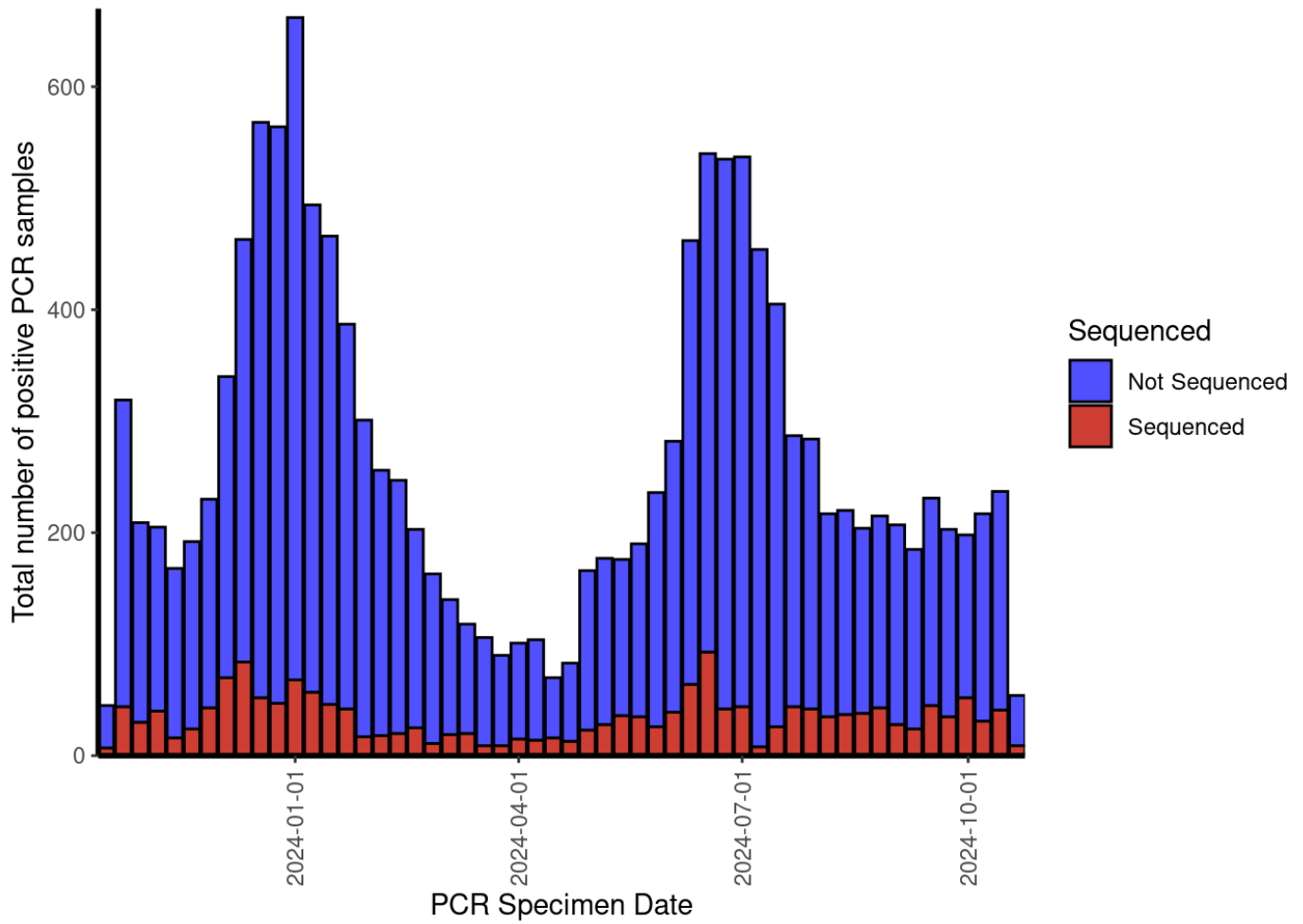


Figure 4.1: Count of sequenced and not sequenced positive COVID-19 PCR samples in Northern Ireland over the last 12 months

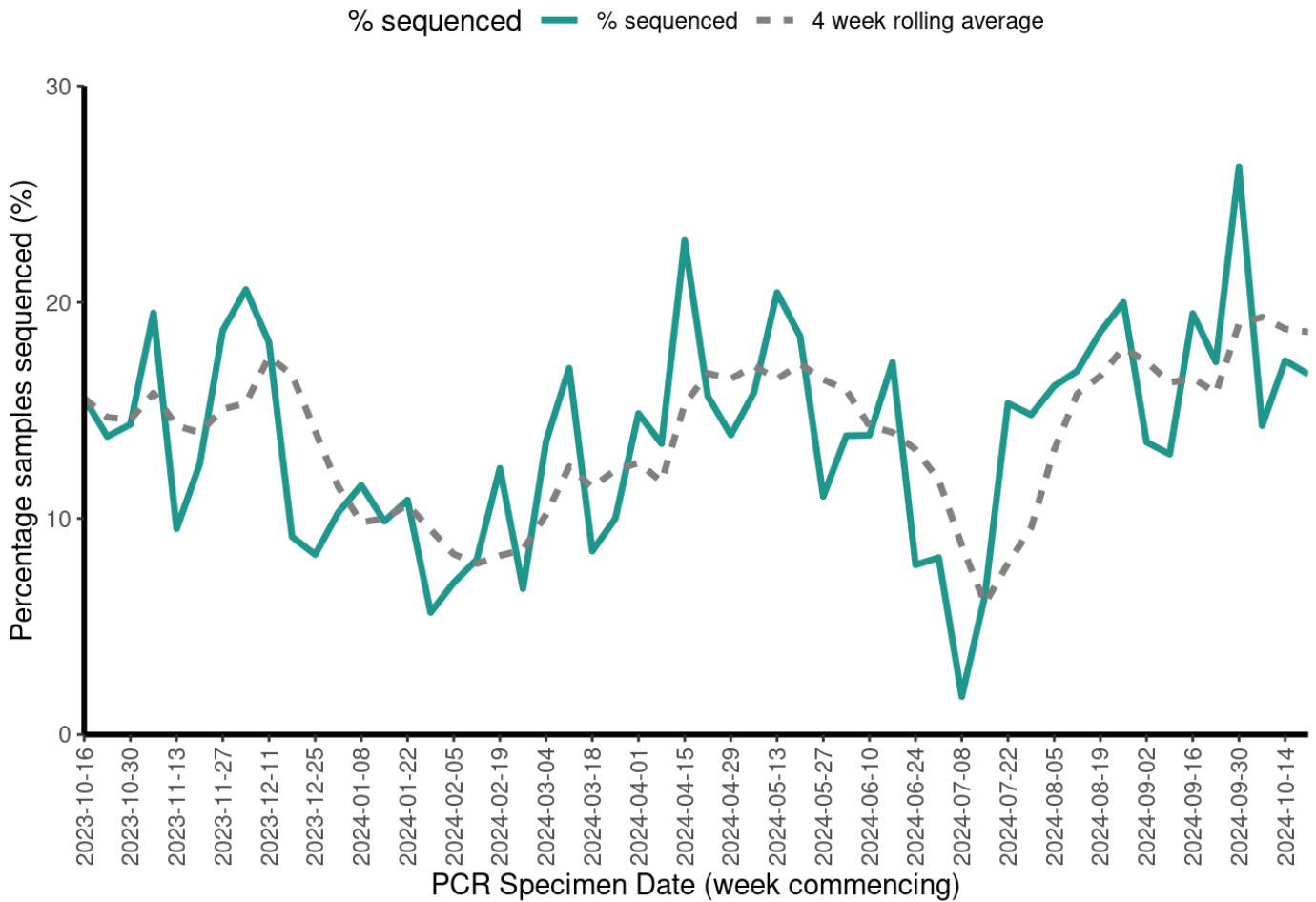


Figure 4.2: Percentage of positive COVID-19 samples sequenced in Northern Ireland over the last 12 months

## 5 Key Definitions and Interpretation

### 5.1 Definitions

- Variant nomenclature - UKHSA made changes to the variant classification system from the 1st April 2022, resulting in previously assigned Variants Under Investigation (VUIs) or Variants of Concern (VOCs) to be assigned with the V nomenclature. Details of the change to the classification system can be found in Technical briefing 39 [here](#).



- Lineage assignment algorithm - on 29th November 2022, the lineage assignment algorithm was switched from PangoLEARN to UShER for lineage counts. PangoLEARN uses a machine learning algorithm, whereas UShER uses phylogenetic placement and produces few unassigned lineages.

## 5.2 Interpretation of variant data

- Lineage counts for recent weeks may increase due to the time lag associated with whole genome sequencing.
- Lineage calls are subject to change following analysis of genomic sequence results, which may result in fluctuations in lineage/variant counts.

## 6 Appendix

### 6.1 Total counts by lineage for the last 8 weeks of sequencing data (02 September 2024 to 22 October 2024)

| <b>Table 6.1. Summary of variants sequenced in Northern Ireland over the past 8 weeks</b> |                       |                     |                        |
|-------------------------------------------------------------------------------------------|-----------------------|---------------------|------------------------|
| <b>Lineage</b>                                                                            | <b>Parent Lineage</b> | <b>Variant</b>      | <b>Sequenced count</b> |
| <b>BA.2</b>                                                                               | <b>BA.2</b>           | <b>VOC-22JAN-01</b> | <b>2</b>               |
| <b>BA.3</b>                                                                               | <b>BA.3</b>           | <b>VOC-21NOV-01</b> | <b>1</b>               |
| <b>KP.2.2</b>                                                                             | <b>KP</b>             | <b>V-23DEC-01</b>   | <b>2</b>               |
| <b>KP.2.3</b>                                                                             | <b>KP</b>             | <b>V-23DEC-01</b>   | <b>5</b>               |
| <b>KP.3.1</b>                                                                             | <b>KP.3</b>           | <b>V-23DEC-01</b>   | <b>13</b>              |
| <b>KP.3.1.1</b>                                                                           | <b>KP.3</b>           | <b>V-23DEC-01</b>   | <b>126</b>             |
| <b>KP.3.2</b>                                                                             | <b>KP.3</b>           | <b>V-23DEC-01</b>   | <b>2</b>               |
| <b>KP.3.3.2</b>                                                                           | <b>KP.3</b>           | <b>V-23DEC-01</b>   | <b>1</b>               |
| <b>LB.1.3</b>                                                                             | <b>JN.1</b>           | <b>V-23DEC-01</b>   | <b>1</b>               |
| <b>LB.1.3.1</b>                                                                           | <b>JN.1</b>           | <b>V-23DEC-01</b>   | <b>1</b>               |

**Table 6.1. Summary of variants sequenced in Northern Ireland over the past 8 weeks**

| Lineage           | Parent Lineage    | Variant           | Sequenced count |
|-------------------|-------------------|-------------------|-----------------|
| <b>LB.1.7</b>     | <b>JN.1</b>       | <b>V-23DEC-01</b> | <b>2</b>        |
| <b>LF.7</b>       | <b>JN.1</b>       | <b>V-23DEC-01</b> | <b>1</b>        |
| <b>MC.1</b>       | <b>KP.3</b>       | <b>V-23DEC-01</b> | <b>13</b>       |
| <b>MC.10</b>      | <b>KP.3</b>       | <b>V-23DEC-01</b> | <b>2</b>        |
| <b>MC.11</b>      | <b>KP.3</b>       | <b>V-23DEC-01</b> | <b>2</b>        |
| <b>MC.13</b>      | <b>KP.3</b>       | <b>V-23DEC-01</b> | <b>3</b>        |
| <b>MC.14</b>      | <b>KP.3</b>       | <b>V-23DEC-01</b> | <b>1</b>        |
| <b>MC.15</b>      | <b>KP.3</b>       | <b>V-23DEC-01</b> | <b>1</b>        |
| <b>MC.16</b>      | <b>KP.3</b>       | <b>V-23DEC-01</b> | <b>5</b>        |
| <b>MC.4</b>       | <b>KP.3</b>       | <b>V-23DEC-01</b> | <b>1</b>        |
| <b>MC.5</b>       | <b>KP.3</b>       | <b>V-23DEC-01</b> | <b>1</b>        |
| <b>Unassigned</b> | <b>Unassigned</b> | <b>Unassigned</b> | <b>21</b>       |
| <b>XEC</b>        | <b>XEC</b>        | <b>V-23DEC-01</b> | <b>58</b>       |
| <b>Total</b>      | <b>-</b>          | <b>-</b>          | <b>265</b>      |

6.2 Total counts and percentage sequenced by parent lineage for the last 12 months of sequencing data (22 October 2023 to 22 October 2024)

**Table 6.2. Summary of variants sequenced in Northern Ireland over the past**

| Parent Lineage    | Variant           | WHO variant name | Sequence count |
|-------------------|-------------------|------------------|----------------|
| <b>KP.3</b>       | <b>V-23DEC-01</b> | <b>Omicron</b>   | <b>535</b>     |
| <b>JN.1</b>       | <b>V-23DEC-01</b> | <b>Omicron</b>   | <b>513</b>     |
| <b>Unassigned</b> | <b>Unassigned</b> |                  | <b>369</b>     |

**Table 6.2. Summary of variants sequenced in Northern Ireland over the past**

| <b>Parent Lineage</b> | <b>Variant</b>      | <b>WHO variant name</b> | <b>Sequence count</b> |
|-----------------------|---------------------|-------------------------|-----------------------|
| <b>BA.2.86</b>        | <b>V-23AUG-01</b>   | <b>Omicron</b>          | <b>70</b>             |
| <b>KP</b>             | <b>V-23DEC-01</b>   | <b>Omicron</b>          | <b>66</b>             |
| <b>XEC</b>            | <b>V-23DEC-01</b>   | <b>Omicron</b>          | <b>65</b>             |
| <b>XBB</b>            | <b>V-22OCT-02</b>   | <b>Recombinant</b>      | <b>60</b>             |
| <b>EG.5.1</b>         | <b>V-23JUL-01</b>   | <b>Recombinant</b>      | <b>57</b>             |
| <b>BA.3</b>           | <b>VOC-21NOV-01</b> | <b>Omicron</b>          | <b>32</b>             |
| <b>XBB.1.5</b>        | <b>V-23JAN-01</b>   | <b>Recombinant</b>      | <b>29</b>             |
| <b>BA.2</b>           | <b>VOC-22JAN-01</b> | <b>Omicron</b>          | <b>23</b>             |
| <b>XBB.1.16</b>       | <b>V-23APR-01</b>   | <b>Recombinant</b>      | <b>23</b>             |
| <b>CH.1.1</b>         | <b>V-22DEC-01</b>   | <b>Omicron</b>          | <b>1</b>              |
| <b>Recombinant</b>    | <b>Recombinant</b>  | <b>Recombinant</b>      | <b>1</b>              |

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