ChronQC: A Quality Control Monitoring System for Clinical Next Generation Sequencing

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**Supplementary Table 1:** ChronQC chart types. Examples of these chart types can be seen at <https://nilesh-tawari.github.io/chronqc>

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| --- | --- | --- |
| Chart type | Description | Use case |
| Time series plot with mean and standard deviation | A time series plot of numerical data with historical runs. Rolling mean and ±2 standard deviations are shown. | Can be used to track metrics such as total number of reads. The window to compute rolling mean and ±2 standard deviations can be set to either a specified duration (e.g. runs in the past year) or number of historical runs (e.g. past 10 runs). |
| Time series plot with an absolute threshold | A time series plot of numerical data with user-defined lower and upper thresholds. | Can be used to track metrics such as depth of coverage, Ti/Tv ratio, and GC content per sample. Lower and upper thresholds can be based on empirical values. |
| Time series plot with percentage of samples above a threshold | A time series plot representing percentage of numerical data above a user-defined threshold. | Can be used to track metrics such as percentage of samples in a run that exceed a certain threshold. |
| Time series plot with percentage of samples with a category label | A time series plot of categorical data representing % of samples in a run with y-value equal to a category label. | Can be used to track percentage of samples in a run with a certain label. E.g. % of samples labeled “PASS”. |
| Time series box-and-whisker plot of numerical data | A monthly time series box-and-whisker plot of numerical data. | Can be used to track number of single nucleotide variants (SNVs) and indels observed for each month. |
| Time series with stacked bar plot | A stacked bar plot of categorical data summarized for each month. | Can be used to track number of observed mutations in clinically actionable genes per month. |
| Time series with bar and line plot | A bar and line representation of categorical data. | Can be used to track number of observed mutations in clinically actionable genes per month. |

**Supplementary Table 2:** NGS tools with their corresponding QC metrics and their chart types implemented in ChronQC’s default configuration.

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| --- | --- | --- |
| Tool name | QC metrics | Chart type implemented in default JSON (config file) |
| FastQC | FastQC\_percent\_gc | time\_series\_with\_mean\_and\_stdev |
| FastQC\_total\_sequences | time\_series\_with\_mean\_and\_stdev |
| FastQC\_percent\_duplicates | time\_series\_with\_mean\_and\_stdev |
| FastQC\_percent\_fails | time\_series\_with\_mean\_and\_stdev |
| FastQC\_avg\_sequence\_length | time\_series\_with\_mean\_and\_stdev |
| QualiMap | QualiMap\_30\_x\_pc | time\_series\_with\_mean\_and\_stdev |
| QualiMap\_percentage\_aligned | time\_series\_with\_mean\_and\_stdev |
| QualiMap\_avg\_gc | time\_series\_with\_mean\_and\_stdev (if FastQC\_percent\_gc is present this plot is omitted to avoid duplication) |
| QualiMap\_mapped\_reads | time\_series\_with\_mean\_and\_stdev |
| QualiMap\_median\_coverage | time\_series\_with\_percentage\_of\_samples\_above\_threshold (Default threshold 30) and time\_series\_with\_absolute\_threshold (Default threshold 30) |
| QualiMap\_total\_reads | time\_series\_with\_mean\_and\_stdev (if FastQC\_total\_sequences is present this plot is omitted to avoid duplication) |
| Bamtools | Bamtools\_mapped\_reads\_pct | time\_series\_with\_mean\_and\_stdev (if QualiMap\_percentage\_aligned is present this plot is omitted to avoid duplication) |
| Samtools | SamtoolsFlagstat\_mapped\_passed | time\_series\_with\_mean\_and\_stdev (if QualiMap\_mapped\_reads is present this plot is omitted to avoid duplication) |
| Bcftools | BcftoolsStats\_number\_of\_MNPs | time\_series\_with\_box\_whisker\_plot |
| BcftoolsStats\_number\_of\_SNPs | time\_series\_with\_box\_whisker\_plot |
| Bcftools\_Stats\_number\_of\_indels | time\_series\_with\_box\_whisker\_plot |
| BcftoolsStats\_number\_of\_records | time\_series\_with\_box\_whisker\_plot |
| BcftoolsStats\_tstv | time\_series\_with\_mean\_and\_stdev |
| Peddy | Peddy\_error | time\_series\_with\_percentage\_category (Default category: True) |
| Any other tool | Columns with numeric data | time\_series\_with\_mean\_and\_stdev |

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