

## Methodological summary

A consequence of a survey process redesign is the introduction of sudden shocks or discontinuities. They are the result of differences in measurement errors and selection errors due to the introduction of a new questionnaire and field work strategies. To avoid sudden disruption of continuous series and that observed period-to-period changes are partially miss-interpreted as real evolutions of the monthly and quarterly labour force figures, it is important to quantify these discontinuities. Statistics Netherlands has implemented a time series modelling approach in combination with a parallel run to facilitate a smooth transition to a new survey process in the Dutch LFS.

For the transition, a parallel run for the first wave with a length of 3 months in the last quarter of 2020 was initially foreseen. To avoid the risk of confounding turning points that are the result of the corona pandemic together with the discontinuities induced by the redesign, the first wave of the old design was extended with a period of six months from January to June 2021. This finally resulted in a parallel run of nine months for the first wave and provided sufficiently precise direct estimates to quantify discontinuities in the first wave by taking differences between the GREG estimates under the old and new design. These estimates are used as a-priori known values in the time series model to accommodate shocks as a result of the discontinuities in the first wave. Discontinuities in the four follow-up waves are estimated with the time series model through level interventions. With this model it is avoided that the monthly labour figures are affected by the implementation of the redesign.

The time series modelling is applied for estimates of the employed and unemployed by sex and age in three categories (15-24, 25-44, 45-74). For the employed by level of education, permanency of the job, usual hours worked, underemployment. For the unemployed by duration of unemployment and for the inactive by the potential additional labour force indicators. The resulting estimates are used in the weighting scheme of the GREG estimator of the quarterly figures for the new design. Thereafter, the correction factors for the requested age groups for the breaks in time series exercise are calculated from the weighted microdata by comparing the quarterly figures of the new design to the estimates of the old design for the three parallel quarters.

The report under this link <https://www.cbs.nl/-/media/pdf/2022/03/lfs-redesign-2021.pdf> describes how the parallel run was conducted and how it was used for the correction of breaks in times series for the main indicators on employment and unemployment by sex and age. A similar exercise has been conducted for the additional indicators on a quarterly basis.