Background The Australian Lupus Registry and Biobank (ALRB) is a longitudinal database of clinical information on SLE patients, with data imported from different sources. The current reporting system does not offer an integrated module that allows visualisation of patients clinical, laboratory and treatment changes. This presents an opportunity for developing a new interactive interface, where physicians and patients can view the historical data to facilitate better informed treatment decisions.

Methods A survey of clinicians who are familiar with the Australian Lupus Registry is done to ascertain required visual elements, forming the user requirement document that captures the clinicians requirements and specifications. The system was developed in JavaScript programming language, utilising the D3.js, CanvasJS, and jquery libraries. The system was implemented using the evolutionary prototyping approach.

Results Our developed interactive web application allowed clinicians to customise the viewing of relevant data for a particular patient, by combining the display of changes in laboratory results and medications in a time-dependent graph. We employed the multiple-axis line graph data visualisation technique, with dynamic axis scaling during zooming in, that allows users to view multiple selected parameters with varying units of measurement. A control panel allows for filtering results to show up to four plots at one time in a single graph, so that relationship between these variables can be viewed in a time-dependent manner. The timeline can be displayed using zooming and panning techniques, while hovering on a point on the graph shows a tooltip of the exact numerical values of a measurement for that timeframe.

Conclusions An interface that can promote physician-patient shared decision-making practice has been developed and proven to be feasible. The integration of a disease progress reporting system into a platform that is used primarily for clinical research can encourage users to have added value when longitudinal data is collected for primary research purpose. The utility of this reporting system will need to be further evaluated in a large-scale study.

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