

Using the NIH Figshare instance to share a cholesterol calculator for reuse and further collaboration and development

A case study of Dr. Alan Remaley and Maureen Sampson

Dr. Alan Remaley, Director of the Immunoassay and Special Chemistry section in the Department of Laboratory Medicine of the Clinical Center and Section Chief of the Lipoprotein Metabolism laboratory in the Cardiovascular and Pulmonary Branch of the National Heart, Lung, and Blood Institute (NHLBI)¹ and Maureen Sampson, a research Medical Technologist in the Department of Laboratory Medicine, have shared an equation calculator for low-density lipoprotein cholesterol (LDL-C) on the NIH Figshare Instance².

This calculator — used to estimate the LDL-C, commonly called “bad cholesterol,” level in patients with a high risk of heart disease — is a more accurate way of measuring these levels than ever before. Due to poor tests for LDL-C, a calculation called the Friedewald equation was developed at the NIH in 1972 to better measure LDL-C levels in patients; this calculator is a further improvement on the initial 1972 calculator. “Because everything is computerized these days, it makes using a more complex equation easier,” said Maureen.

"Maureen and I used a mathematical approach that hasn't been used before and realized that there were several parameters: a standard lipid panel which includes triglycerides (another type of fat), total cholesterol, and high-density lipoprotein cholesterol (HDL-C)," said Alan. "We used a more complicated equation and were able to fit these parameters into it. This is the basis for our latest paper."

This paper has been published in JAMA Cardiology³, a widely-accessed journal, to reach as many cardiologists and medical professionals as possible who can use it. The calculator itself is an Excel spreadsheet that calculates the LDL-C using the Friedewald equation, the Martin Factor — an improvement on the Friedewald equation developed a few years ago, — and the new

Sampson equation developed by Maureen, Alan, and their colleagues.

"We wanted to make sure it was freely, openly available and not patented, so we uploaded the spreadsheet to the NIH Figshare instance to allow people to very quickly implement this equation in their clinical laboratory and hopefully improve upon it," said Alan.

Alan and Maureen have data from other papers published previously that they will similarly share to make them as discoverable and reusable as possible, especially as they are often emailed to provide the data behind their publications. "Anything that suits itself to sharing is a good idea," said Alan. "It empowers people and it's the perfect solution to sharing our data."

The screenshot shows the Figshare page for a software tool titled "Equation Calculator for Low-Density Lipoprotein Cholesterol". At the top, it indicates the file is "Sampson LDL-C and VLDL-C Equationxlsx (68.05 kB)" with a DOI of "MD5: 853ee71eb1ab763e766c4eec5178ecd8". Below this are buttons for "Cite", "Download (68.05 kB)", "Share", "Embed", and "+ Collect (you need to log in first)".

The main title is "Equation Calculator for Low-Density Lipoprotein Cholesterol". It is labeled as "Version 2" and was posted on 21.04.2020, 20:35 by Maureen Sampson, Clarence Ling, Qian Sun, Roa Harb, Mohamed Ashmaig, Russell Warnick, Amar Sethi, James Fleming, James Otvos, Jeff Meeusen, Sarah Delaney, Allan Jaffe, Robert Shamburek, Marcelo Amar, and Alan T. Remaley.

The description states: "A new low-density lipoprotein cholesterol equation was derived with results from a standard lipid panel that can be used to more accurately estimate the low-density lipoprotein cholesterol level in patients with plasma triglyceride levels up to 800 mg/dL and is at least equivalent or more accurate than other equations for patients with normolipidemia and a low level of low-density lipoprotein cholesterol."

The funding section mentions: "This research was supported by the Intramural Research Program of the National Heart, Lung, and Blood Institute at the National Institutes of Health HL002058-24".

On the right side, there are statistics: 444 views, 64 downloads, and 0 citations. Below these is a circular badge with the number "3". The NIH logo is also present. A "CATEGORIES" section lists: Clinical Chemistry (diagnostics), Biomarkers, Cardiology (incl. Cardiovascular Diseases), and Medical Biochemistry: Lipids.

Sampson, Maureen; Ling, Clarence; Sun, Qian; Harb, Roa; Ashmaig, Mohamed; Warnick, Russell; et al. (2020): Equation Calculator for Low-Density Lipoprotein Cholesterol. figshare. Software. <https://doi.org/10.35092/yhjc.11903274>

References:

1. <https://www.nhlbi.nih.gov/>
2. <https://nih.figshare.com/>
3. <https://jamanetwork.com/journals/jamacardiology/article-abstract/2761953>