FONDAZIONE BRUNO KESSLER
MAGAZINE

Children's Eyes: From Trentino, a New Digital Model Connecting Pediatricians and Telemedicine

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An important step forward in protecting children's eyesight has been marked by the publication in Scientific Reports, a Nature Portfolio journal, of the study "Digital infrared reflex testing and asynchronous teleconsultation for infant eye screening."

The research, developed as part of the "**Digital Health and AI**" project funded by the **Autonomous Province of Trento** (Resolution No. 2475 of 12/22/2022), demonstrates how technology can enhance infant eye *screening* and improve prevention in the region.

Why is this important?

The first **six months** of a baby's life are crucial for detecting eye conditions such as congenital cataracts. **Timely diagnosis** is therefore essential to intervene before visual development is permanently compromised. However, early identification of opacity in the anterior segment of the eye is often hindered by a l**ack of specialists and resources**. The scientific article highlights how the use of **digital images** shared between primary care pediatricians and ophthalmologists represents a **valid and accurate method** for early detection of eye abnormalities, overcoming the logistical limits of in-person specialist visits. Despite some **operational challenges** related to staff training and processing times, the results show a high level of diagnostic agreement with traditional tests.

In summary, the adoption of these **digital working** methods promises to improve clinical documentation and, as **Dr. Federica Romanelli**, Head of the Multizonal Operating Unit of **Ophthalmology** at **ASUIT**, notes, "paves the way for future applications of **Artificial Intelligence** for even faster and more precise diagnoses, allowing us to create a **safety net** that protects children's vision from the very first stages of visual development."



“We have verified that the method is accurate and feasible,” reported ***Dr. Elisabetta Racano*** from the Multizonal Ophthalmology Unit, which handled clinical supervision and data analysis together with the **Epidemiology Service**. *“Digital images are collected through the **digital infrared reflex test** (IRRT), and in the case of a positive or uncertain result, they can later be evaluated by specialist clinicians (so-called ‘**asynchronous teleconsultation**’).*

The screening results speak for themselves: feasibility of **84%** and nearly perfect diagnostic agreement **(99%)** with traditional tests, making it a reliable tool for primary prevention.”

Research sample



The study involved a total of **189 infants** between April 2024 and March 2025. Each child underwent both **the digital infrared reflex test (IRRT)** and the **standard red reflex test (RRT)** to compare their accuracy.

Teamwork

The success of the trial is based on a strong collaboration among key health and research partners in Trentino:

- **TrentinoSalute4.0 (TS4.0) and Fondazione Bruno Kessler (FBK)**, through *project manager* **Giulia Malfatti**, led the technological integration and study design;
- The Trentino **Integrated University Healthcare System (ASUIT)**, with the Multizonal Ophthalmology Operating Unit directed by Dr. **Federica Romanelli** and the Epidemiology Service—where specialist **Elisabetta Racano** and statistical expert **Riccardo Pertile** supervised data collection and analysis, respectively;
- Pediatricians (**Adele Compagnone, Marta Betta, Roberta Pasquini, Lorena Filippi, and Lucia Pavanello**), who performed the digital tests on their young patients directly in their offices.

Conducting the study within this age group made it possible, on an experimental basis, to integrate *screening* into routine well-child visits carried out by **pediatricians**. This approach brings advanced diagnostics directly **to pediatrician offices, sparing families** the need to travel to specialist centers for routine checkups.

The research confirms **Trentino** as a **laboratory for innovation**, where community-based medicine and digital technologies come together to improve care and well-being in smaller towns and cities.

About the journal Scientific Reports

Scientific Reports is an *open-access* scientific journal from *Nature Portfolio* that publishes original research across major fields of the natural sciences, medicine, psychology, and engineering. It is *peer-reviewed* and indexed in major international databases (Web of Science, PubMed, Scopus, Google Scholar) and, in 2024, was the **third most cited journal in the world**, with more than 834,000 citations according to *Journal Citation Reports* (Clarivate). The journal ensures broad international visibility thanks to its open-access model and high traffic on the nature.com website.

Please follow this link to the paper: https://www.nature.com/articles/s41598-026-40517-3

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