FROM THE INCUBATOR TO KANGAROO MOTHER CARE

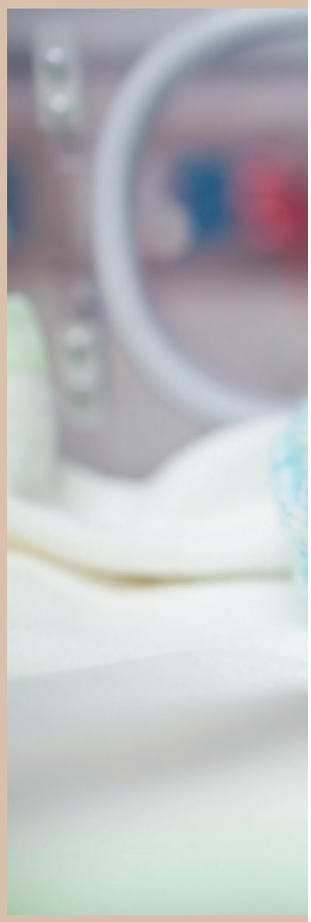
The Faculty of Economics Research Group at the Universidad del Rosario is participating in a research project that has lasted over 20 years, bringing to light developmental differences between premature newborns treated with "kangaroo mother care" and those who were placed in incubators.

The World Health Organization (WHO) calculates that more than 15 million babies around the world are born prematurely every year, and one out of every 10 newborns has difficulty developing and growing normally. Sadly, more than one million of these babies die during the first two months of their lives due to those complications. And most of those who survive face difficult lives that include learning, vision, and hearing problems. Being born before completing the prenatal stage of development may mean physical and mental disadvantages lasting a lifetime.

Premature birth is the principal cause of death for children under five in all countries, regardless of their parents' social and economic conditions. According to the WHO, low birth weight, defined as under 2,500 grams, was associated with 44% of the 2,763,000 neonatal deaths recorded worldwide in 2013. Economic inequality among countries has had a direct impact on the survival

By Alejandro González / **Photo by** 123rf

According to the World Health Organization, over 15 million children are born prematurely in the world every year. It is estimated that over one million of them die in the first two months of life.



of these premature babies. The WHO states that in less developed countries, newborns and premature babies born before the 32nd week of pregnancy die due to lack of effective care including sufficient heat, good nutrition, and basic support to tackle infections and respiratory difficulties. Babies in high income countries survive these kinds of problems.

Until 1978, premature newborns were routinely placed in incubators for several months to provide heat, stabilize their body temperature, and allow their organs to finish maturing. There was a time that year when there were many such babies at the Instituto Materno Infantil [Mother and Child Institute] in Bogotá, but an insufficient number of incubators were available to treat them all. In response to that crisis, that hospital's Dr. Edgar Rey came up with an alternative method for their care.

This technique was called "kangaroo mother care," and it provided premature babies with the heat they needed through skin-to-skin contact with their parents. It is unnecessary for them to remain in the hospital, although they are required to come in for very rigorous daily evaluations, while this must not interrupt feeding with maternal breast milk.

↑ Premature birth is the main cause of death in the first five years of life all around the world, irrespective of parents' social or economic conditions.

From that point on, the kangaroo care approach has become well established thanks to the benefits it has shown in contrast to incubator use.

LOOKING FOR EVIDENCE

By 1993, the kangaroo mothers program had developed a much improved protocol. Steps were gradually implemented in keeping with infants' development, parents were provided with detailed guidelines, and safety controls safeguarded babies' lives. "Even though those who were implementing the technique then knew of its benefits, there was still no scientific proof of its seeming advantages compared to incubator use," comments Darwin Cortés, professor at the Faculty of Economics of the Universidad del Rosario.

At the Clínica San Pedro Claver, Colombia's largest public hospital at that time, a group of researchers from several universities carried out a study with 716 premature babies born between September 1993 and September 1994. The babies were assigned the use of incubators or randomly placed on the kangaroo program to determine infant mortality and analyze the mental and physical development of the children during their first year of life.

Photos by 123rf / Leonardo Parra

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> **Darwin Cortés**
> Researcher

Initial results showed that while there were no great differences in mortality rates compared to the use of incubators, key characteristics of the kangaroo program stood out. For example, the kangaroo babies established closer bonds with their parents because they were not confined to the hospital. This encouraged a better family climate.

Twenty years later, an interdisciplinary group comprising doctors from different specialties, psychologists, engineers, neuroscientists, and economists, carried out a follow-up study of the development of babies involved in the 1993 study.

This was conducted by experts from the Universidad del Rosario, the Canguros Foundation, the Pontifical Xavierian University, the Universidad de los Andes, San Ignacio University Hospital, and the San José Children's Hospital, with the added participation of specialists from Laval University and the St. Justine Hospital in Montreal, both in Canada. Between January 18, 2013 and December 26, 2014, the group located 494 people who had survived their first year of life, representing 69% of the 716 children in the original research. Of this group, three had died after their first birthday, eleven were no longer in Bogotá, and 39 did not want to participate in the continuing research. The remaining 222 of these young adults could not be found but, based on civil registry data, are presumed to be living.

The follow-up study analyzed the results of 438 participants (226 kangaroo babies and 212 incubator babies) from the original study. "Kangaroo and incubator groups within the final sample were compared with regard to their educational and occupational records and different medical, psychological, and neurological variables," says Darwin Cortés, a member of the multidisciplinary research group running this study.

The researchers' analyses of educational and occupational variables led to an apparently paradoxical double outcome. On the one hand, it was found that the kangaroo babies grew up to have, on average, higher incomes than the incubator babies. On the other hand, the kangaroo babies had lower mean scores in mathematics and language skills than the incubator babies.

Current research now focuses on trying to understand this apparent paradox and relate economic variables to brain development. Even after over 20 years of research, studies still continue to analyze and compare data obtained from these young people.