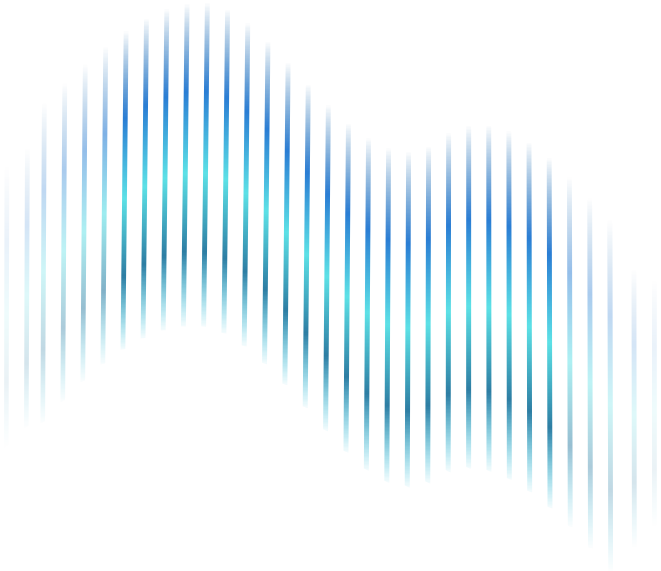
SAMS

Restoring Sound

Hearing Care for Children in Syria



Resorting SOUND
Hearing Care for Children in Syria
January 2026

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MISSION & VISION

Our mission is dedicated to delivering life-saving services, revitalizing health systems during crises, and promoting medical education via a network of humanitarians in Syria, the US, and beyond. Our vision is to strengthen the future of Syria's healthcare, delivering dignified medical relief where needed, fortified by a dedicated medical community.

ABOUT SAMS

The Syrian American Medical Society (SAMS) was founded in 1998 as a professional society to provide networking and educational opportunities for medical professionals of Syrian descent across the United States. The charitable arm of SAMS, the SAMS Foundation, was launched in 2011. With the eruption of the conflict in Syria, SAMS Foundation became one of the most active medical relief organizations working on the front lines of crisis relief in Syria, neighboring countries and beyond.

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About This Report

This report was prepared by the Syrian American Medical Society (SAMS) to describe the situation of childhood hearing loss in Syria and to support efforts to rebuild a system of care that reaches children in all governorates. It brings together the organization's experience providing specialized hearing services during the conflict years, together with national guidance and published regional evidence. The report draws in particular on SAMS Program data to illustrate the profile of children assessed for hearing loss and the type of care they received.

The report aims to provide a clear picture of the challenges facing children with hearing loss, the services currently available, and the areas that require coordinated action as national systems begin to reconnect across the country.

Who should read this report?

This document is intended for health authorities, policy makers, humanitarian organizations, clinical partners, professional associations, and donors involved in the planning and delivery of child-health and rehabilitation services in Syria. It may also be useful for educators, disability advocates, and organizations working with families of children with hearing loss. The report was written to support a common understanding of needs and to help guide practical steps toward a more organized national approach to early detection, intervention, and rehabilitation.

Acknowledgments

This work reflects the efforts of many people and organizations who supported children and their families during every step of the hearing-care pathway.

SAMS extends its appreciation to MED-EL, whose technical support made it possible to carry out device activation, fitting, and early calibration sessions for implanted children. Their contribution helped families navigate the first stages of using a cochlear implant with confidence and safety.

We also thank My Right to Hear, whose assistance with implants and clinical instruments strengthened the capacity of teams in northwest Syria. Their partnership expanded the number of children who could receive timely assessment and intervention.

Finally, we acknowledge the many individuals, medical teams, volunteers, and supporters, both inside Syria and abroad, who sustained this program through donations, expertise, and logistical help during difficult years. Their commitment allowed numerous families to access services that would otherwise have remained out of reach.

Preface

For many years, during the most difficult moments of the Syrian conflict, families would come to our clinics with the same quiet question: *"Why can my child not hear me?"* It was a question shaped by worry, uncertainty, and the long search for answers in a health system under tremendous strain. As physicians and humanitarians, we understood that hearing loss was not simply a medical condition. For a child, it determined how they learned, played, and built relationships. For a family, it shaped daily life in ways that were often invisible to others.

The idea of establishing a structured hearing-care program within SAMS grew from witnessing this need again and again. In the early years, resources were limited, and the health system in many parts of Syria was overwhelmed. Yet even in those circumstances, it was clear that children affected by hearing loss deserved the same chance at communication and inclusion as any other child. The earliest efforts focused on providing hearing aids to children who had no access to testing or follow-up care. These beginnings were modest, but they created a path forward and showed us what was possible when commitment met community trust.

Over time, the program expanded. Volunteers, audiologists, speech therapists, and surgeons joined forces to build a coordinated pathway for assessment, hearing-aid provision, cochlear implantation, and rehabilitation. These efforts took shape slowly, patient by patient, as families taught us what support truly meant. What began as a small initiative became one of SAMS' most comprehensive specialized programs, reaching children from across Syria and giving many of them the chance to hear familiar voices for the first time.

Today, following the political changes in Syria, there is renewed space for national collaboration and hope for a future where hearing care is available to every child, regardless of origin, circumstance, or background. This report arrives at an important moment. It offers evidence, experience, and a framework for building a system that can grow beyond humanitarian response and into national strategy. The work is far from finished, but the progress achieved so far shows what is possible when dedication and compassion guide our actions.

I am grateful to the SAMS teams who built this program with perseverance and integrity, to the partners who supported its growth, and above all to the families who trusted us with their children's care. Their resilience continues to light the way forward.

Mufaddal Hamadeh

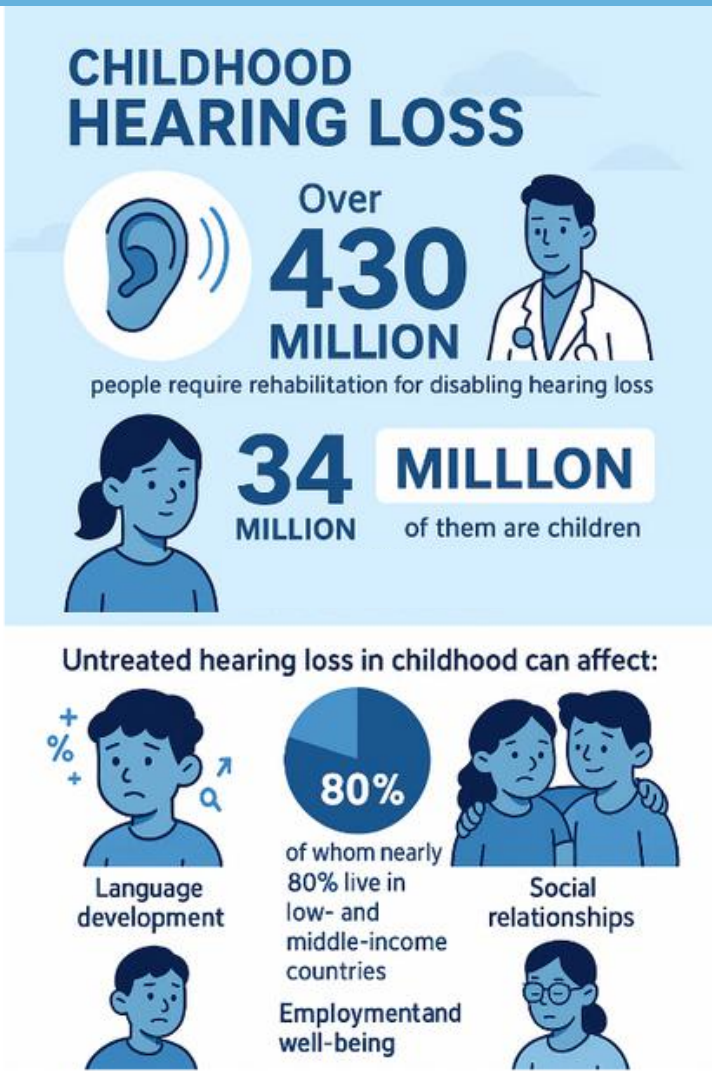
Dr. Mufaddal Hamadeh
Former President and Current Board Member
Founder of the Hearing Aid Program at SAMS

When Families First Notice

Overview of childhood hearing loss

Parents often notice the early hints before anyone else, that moment when they first sense that their child did not hear them. A baby who did not startle at loud sounds, a toddler who did not turn to a familiar voice, a preschool child whose words remained unclear long after siblings were already speaking. These early doubts usually begin at home, long before families reach a place where someone can listen, test, and explain what is happening.

Childhood hearing loss is common across the world. Global estimates from the World Health Organization suggest that over 430 million people require rehabilitation for disabling hearing loss, including 34 million children, with nearly 80 percent living in low- and middle-income countries. [1] Where early detection and rehabilitation are not yet universal, untreated hearing loss in childhood affects language development, learning, social relationships, and later, employment and emotional well-being. [2]



Faint Noises, Early Signs

The pathway from first signs to diagnosis, treatment, and rehabilitation

The journey toward treatment begins with a simple question: Why is my child not reacting, responding, or speaking like others of their age? Screening and basic hearing tests help answer this question. Newborns are usually checked with quick, painless tests that show whether their ears respond to sound. Older children sit with an audiologist and listen to tones at different volumes. These tests help determine how much sound the child can hear and whether the loss is mild, moderate, severe, or profound. This information guides the next steps in care.

When a child is diagnosed with hearing loss, families are offered two main forms of support: hearing aids or cochlear implants. Hearing aids amplify sound and work best for children who still have enough natural hearing to benefit from louder, clearer speech. Research stresses that hearing aids are not simply devices to be handed out. They must be fitted carefully, adjusted regularly, and supported with counseling for families so that children receive consistent and meaningful access to sound. Many children with mild or moderate loss make strong progress this way.

For children whose hearing loss is severe or profound, amplification alone often cannot provide enough access to speech. In these cases, cochlear implants may offer the clearest path forward. Implants bypass the damaged parts of the inner ear and send sound directly to the auditory nerve. Studies from many countries show that children who receive implants early in life, particularly before two years of age, are more likely to develop stronger listening and spoken language skills as they grow. [3] Families often describe this step as both hopeful and difficult, because it requires surgery, frequent appointments, and sustained rehabilitation.

Families often describe this journey as long but meaningful. It begins with quiet concerns at home and continues through tests, fittings, and therapy sessions. With patient guidance and steady rehabilitation, small moments of progress, turning toward a voice, recognizing a word, trying a new sound, slowly gather into larger steps forward.

Rehabilitation is central to progress for any child with hearing loss, whatever device they use. Therapists help children learn to notice sounds, shape early words, and communicate with growing confidence. International guidance on early intervention highlights how regular practice, family participation, and steady follow-up can make a lasting difference in a child's progress. Research also shows that children who receive consistent support over time tend to develop clearer communication skills and are better able to join fully in school and daily life. [4] For many families, rehabilitation becomes a familiar place where small moments of progress slowly gather into larger steps forward.

Sound Lost in a Fragile Landscape

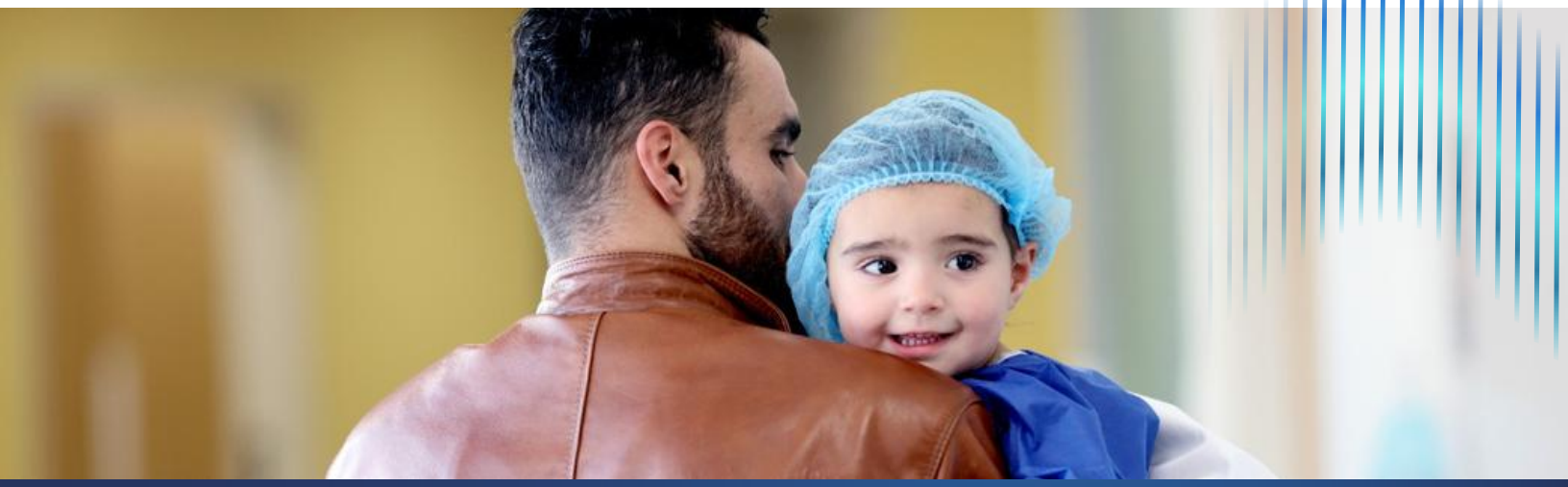
Hearing Loss within Syria's Fragile Health System

Causes of hearing loss in Syrian children mirror those described across many low- and middle-income settings. Genetic factors, congenital anomalies, complications during pregnancy and birth, severe neonatal jaundice, meningitis, chronic ear infections, and exposure to ototoxic medications are all recognized contributors to permanent hearing loss in childhood, as documented in regional and international literature. [5][6][7]

Syria is emerging from fourteen years of conflict with a fragmented health system [8] and persistent gaps in child health and disability services. Recent assessments indicate that disability is widespread: a 2025 Norwegian Refugee Council study estimated that nearly 28 percent of people in northwest Syria live with some form of disability [9], while UNICEF reports that approximately 2.8 million people with disabilities remain inside the country, many of them children. [10] Within these figures, hearing loss remains largely invisible because it is seldom screened for and is rarely captured by routine health information systems.

National data on childhood hearing loss are limited. One school-based screening in Damascus identified hearing impairment in 6.7 percent of primary-school children assessed. [11] For Syrian newborns and children living through conflict, the usual medical causes of hearing loss occur alongside malnutrition, disrupted antenatal care, unsafe deliveries, and limited access to timely treatment. These conditions can heighten the risks of preventable hearing impairment. Newborn hearing screening studies among Syrian refugee infants in Türkiye show markedly higher referral and failure rates compared with Turkish newborns, with hearing loss linked to low birth weight, intensive care admissions, and severe neonatal jaundice. [12]

Because Syria lacks nationwide newborn or school-age hearing data, estimates must rely on regional studies and global epidemiology. Drawing on international prevalence ranges for permanent childhood hearing loss, as well as findings from comparable low- and middle-income countries [13] and Arab region studies, [14] it is reasonable to anticipate that between 800 and 1,600 newborns in Syria may be born each year with permanent hearing loss requiring structured follow-up. Based on population size and expected severity patterns, approximately 1,000 children annually are likely to require hearing rehabilitation, including hearing aids, cochlear implantation, and speech and language therapy.



Growing Up Between Silence and War

Hearing care in Syria before and during the conflict

Before the conflict, hearing care in Syria was limited to a handful of tertiary hospitals and specialized ENT centers in major cities. Care consisted of diagnostic audiology, management of ear disease, and limited hearing-aid fitting, almost entirely dependent on specialists concentrated in Damascus, Aleppo, and a few regional hospitals. No universal newborn-hearing-screening system existed, and early identification of hearing loss was not a routine part of child-health services. Regional reviews of health systems in the Middle East before 2011 describe Syria's audiology and rehabilitation services as comparatively underdeveloped and unevenly distributed, with rural areas having scarce or no access to diagnostic or rehabilitative care.

During the conflict, hearing care capacity weakened severely. Many hospitals with audiology units were damaged, staff were displaced, and access to ENT specialists became uneven across governorates. Families often faced long delays before reaching a center able to provide diagnostic testing, and treatment options depended heavily on private out-of-pocket services. Rehabilitation was even more limited; most public facilities lacked the staff, devices, and materials needed to support children with hearing loss. Disruption of neonatal care, increased use of ototoxic medications, higher rates of premature births, and repeated displacement all contributed to increased risk of preventable or untreated childhood hearing loss. In several governorates, especially in the northwest, public hearing-care services collapsed entirely.

Following a preparatory phase between 2018 and 2023, the former Ministry of Health launched the first national program for early detection and intervention (EHDI) for newborn hearing loss across public and private hospitals. [15] The program screened more than 22,422 newborns in its initial phase, yet only a very small number progressed to diagnosis and intervention, with 24 children receiving hearing aids, and four others moved forward to cochlear implants. This limited conversion number reflected the broader weaknesses of the health system at the time, including fragmented referral pathways and limited public-sector capacity for specialized care. [16]

Overview of the achievements of the Syrian National program for early detection and intervention in its first year of 2024

Activities	Achieved (August 2024)
Newborn Hearing Screening	23,000 screened; 320 screening centers active
Diagnostic Assessment	133 children diagnosed; 41% of failed screenings reached diagnosis
Hearing-Aid Fitting	25 centers fitting; 20 children fitted; 5 fitted with bone-conduction devices (64% of eligible)
Cochlear Implantation	8 children assessed: surgeries completed for eligible cases (4 children)
Rehabilitation	14 children enrolled (50% of the eligible)

By the end of the conflict period, public-sector hearing care remained limited, with families frequently relying on private centers or humanitarian actors for assessments, devices, and rehabilitation.

Echoes of Recovery

A new hope for children's hearing in post-conflict Syria

Following the political transition of December 2024, hearing care entered a new phase. As Syria rebuilds, hearing services for children are shaped by both national institutions and an array of public, charitable, and humanitarian actors.

In February 2025, the newly established Ministry of Health announced a National Cochlear Implant and Aural Rehabilitation Program for Children, developed in cooperation with the humanitarian community.

Charitable organizations such as Al-Ameen have, with support from King Salman Humanitarian Aid and Relief Centre, organized major cochlear implant campaigns in Damascus and other cities inside Syria, aiming to reach 940 children over two years through partnerships and providing at least initial rehabilitation[17]. These efforts complement public programs and have brought the subject of hearing loss to wider public attention.

At the regional level, humanitarian initiatives have provided cochlear implants to Syrian refugee children in Türkiye and other countries and have drawn attention to the impact of delayed implantation and limited rehabilitation on language outcomes. [18]

SAMS sits within this broader picture as one of the organizations that developed a comprehensive cochlear implant program during the conflict period. Such governmental and humanitarian actions are laying the groundwork for a nationwide system for early detection, intervention, and rehabilitation for childhood hearing loss.

Humanitarians to the rescue

Role of Humanitarian Actors during the conflict

During the active conflict phase, northwest Syria remained outside government control, and public health services were largely withdrawn from the area. [19] In the absence of state provision, the health sector came to rely on non-governmental organizations, which became the main providers of health services. Specialized services, however, including hearing care, remained very scarce and were less prioritized in favor of emergency and primary health care services. [20] Based on the region's birth cohort and prevalence estimates from comparable settings, approximately 300 children each year in northwest Syria are likely to require structured hearing rehabilitation. In response to this need, despite restricted resources and the absence of steady funding for advanced services, SAMS was able to develop and sustain a structured humanitarian cochlear-implant pathway through the contributions of its members and targeted donations. Beginning in 2022, the organization carried out assessments, surgeries, and multi-phase rehabilitation cycles. Alongside SAMS, a handful of other humanitarian actors, such as Shafak and Al-Ameen, implemented hearing-aid programs or supported screening activities when possible. While these efforts provided important assistance to individual families, the overall availability of specialized care remained limited.

We can hear you

SAMS' hearing-care response across Syria

Referral pathway and dataset development
In 2022, SAMS began accepting referrals for children with suspected hearing loss. Within a short period, primary-care physicians, pediatricians, and community health workers across the northern governorates were sending families to the program, often after noticing that a child did not respond to familiar voices or everyday sounds. To respond, SAMS established five centers capable of providing a full audiological assessment. Each was staffed with trained personnel and equipped to follow a standard evaluation pathway.

Demographics
Upon referral, SAMS centers used a detailed questionnaire that recorded the child's age, main concerns, family observations, developmental history, and any previous hearing test or device use. When possible, a basic hearing test was performed at the referring site. These steps enabled the assessment centers to prioritize appointments and prepare for a structured evaluation. Over time, the individual forms and assessments accumulated into one of the most detailed datasets available on childhood hearing loss in the northwest part of Syria. The anonymized dataset contains more than 1,634 assessment records of children with some level of hearing loss; 1,417 records correspond to residents of Idleb and 217 to residents of the Aleppo countryside. After cleaning incomplete entries, boys accounted for 56% of cases and girls for 44%.

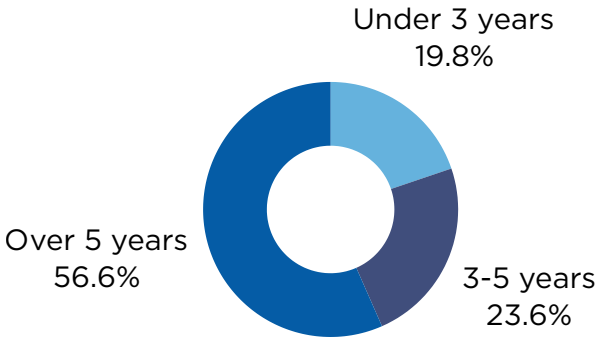
Children reached the centers at widely differing ages, which has direct implications for language development and educational outcomes. The median age at assessment was 5.6 years. Almost one-fifth of children, 19.8%, were younger than three years, a group that still falls within the optimal window for early intervention. A further 23.6% were between three and five years of age. The largest group, 56.6%, was older than five years, indicating that more than half of the children with significant hearing loss were first assessed after they had already reached school age.

The hearing-care Programme emerged alongside other specialized services that SAMS developed to fill these gaps. These included oncology support, advanced dental services, cardiology and catheterization capacity, and ophthalmology. Hearing care, particularly for children, became one of these services, reflecting the organization's commitment to provide access to interventions that were otherwise unavailable.

Age distribution among assessed children

Age	Count
<3	324
3-5	385
>5	925

Total Beneficiaries: 1,634



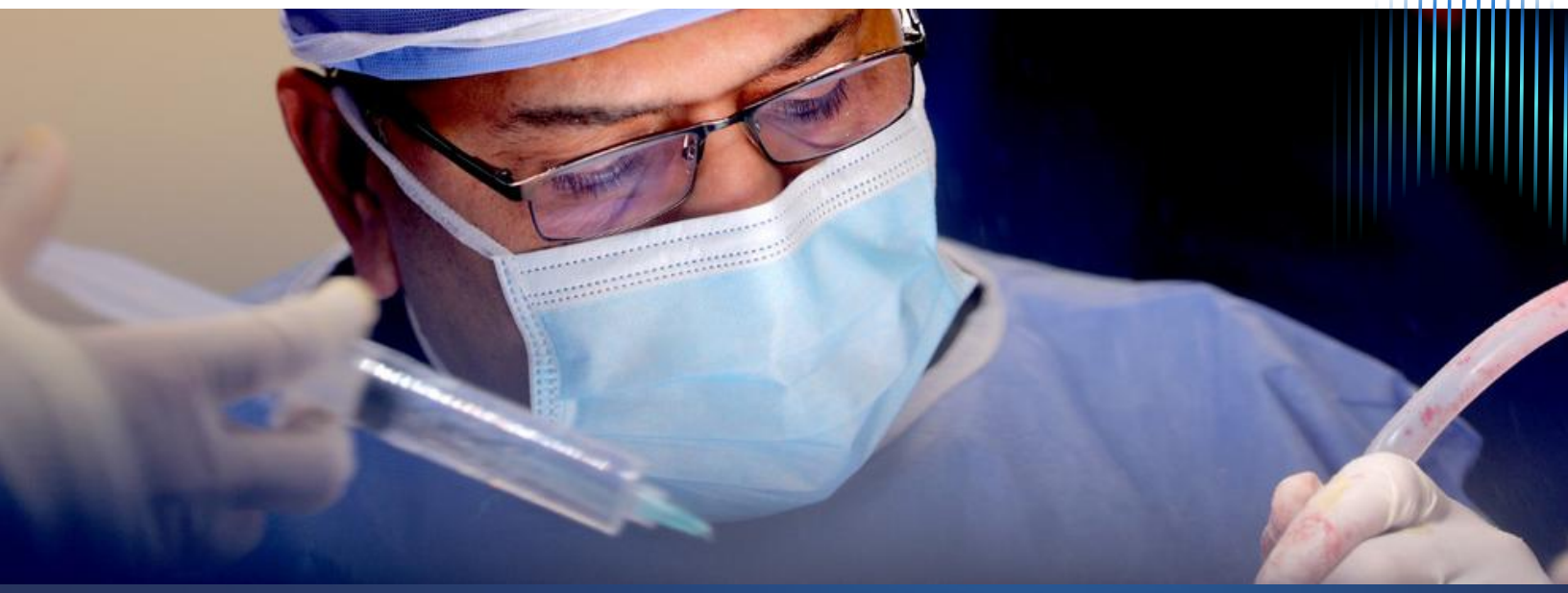
Social determinants of health in the dataset add context to these clinical findings. Around 3% of children were recorded as orphans. More than 75% had a recorded disability or injury, often referring to the hearing loss itself. Nearly 25% had already dropped out of school. These entries do not explain why hearing loss occurred, but they reflect the multiple forms of vulnerability many families were navigating while trying to understand and manage their child's condition.

Hearing diagnosis

Testing capacity differed between centers, but brain-stem diagram testing formed the backbone of audiological evaluation and was performed for 78.4% of children. Pure-tone audiometry, which requires a higher level of cooperation from the child, was used less frequently and was completed for 16.6%. Tympanometry, which helps identify middle-ear conditions such as effusion, was recorded in 4.2% of cases. Audio broadcast tests were used in 2.6% of assessments. This pattern reflects both the availability of equipment and the need for objective tests that can be used with very young children or those who have difficulty participating in behavioral audiometry.

Types of diagnostic tests performed

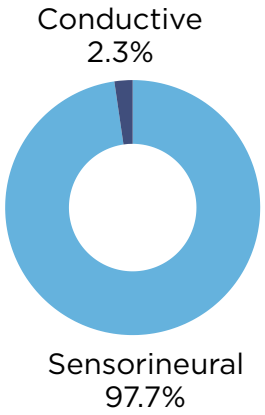
Test Type	Performed	Not performed	% performed
Brainstem Diagram	1,281	353	**78.4%**
Pure-tone audiometry	271	1,363	**16.6%**
Tympanometry	68	1,566	**4.2%**
Audio broadcast	43	1,591	**2.6%**



Diagnostic outcomes showed a consistent picture. Almost all assessed children had sensorineural hearing loss, which is typically permanent and linked to inner-ear or auditory-nerve dysfunction. Of the 1,634 assessments, 1,597 children, or 97.7%, were diagnosed with sensorineural loss, while only 37 children, or 2.3%, had conductive loss. The very small share of conductive cases suggests that children with transient or purely middle-ear conditions are underrepresented in this cohort, and that referral systems are mostly capturing children with more severe and long-lasting impairment.

Type of hearing loss

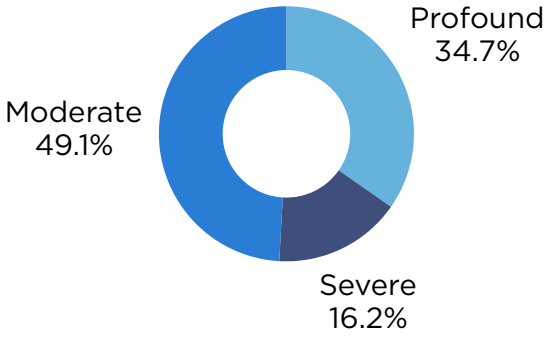
Hearing-loss type	Count
Sensorineural	1,597
Conductive	37



Where numeric thresholds were available, average hearing levels were approximately 90.0 dB in the right ear and 89.7 dB in the left ear. On standard severity scales, thresholds in this range fall within the severe to profound categories. This implies that many children were not only late to be assessed, but were also living with very significant levels of hearing loss by the time they reached specialized services. Categorized severity confirms this pattern:

Hearing-loss severity distribution

Severity	Count
Profound	567
Severe	264
Moderate	803



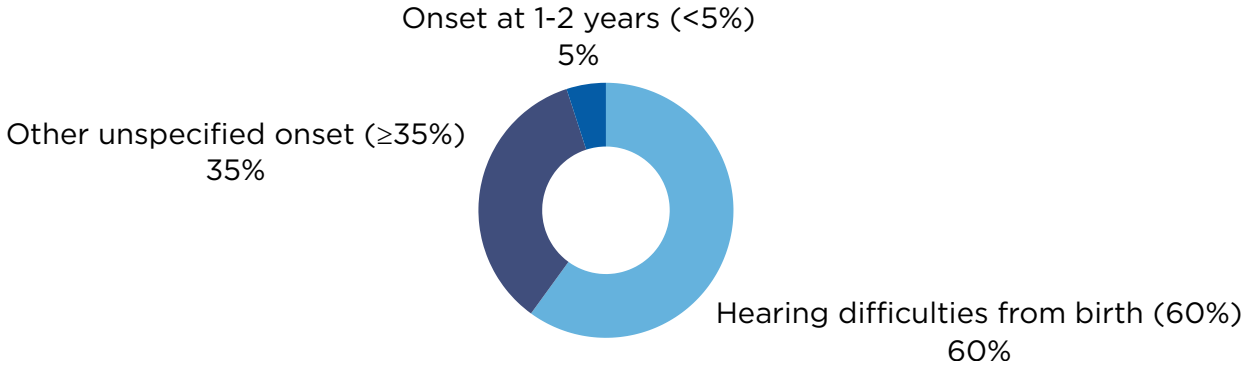
Although almost half were labeled as “moderate,” many of these entries still reflected thresholds high enough to significantly affect communication, especially given the late age at which most children presented for assessment.

Timing of hearing loss and discovery

Around 988 children, representing about 60% of the cohort, were described by their caregivers as having hearing difficulties from birth. Reports of hearing loss beginning later in early childhood were much less common; entries referring to onset around one or two years of age made up fewer than 5% of all cases.

Category of hearing-loss timing

Category	Count
From birth	988
Since 2 years	20
Since 1 year	19
At age 1	12
Since 10 years	11
Other	(each <10 cases)



Information on the age at which families first recognized the problem was recorded for only part of the cohort, but the available data show that many children were not brought for formal assessment until they were already of school age. This pattern points to long delays between early parental concern and access to specialized care, a delay linked to the limited availability of audiological services during the conflict years rather than a lack of awareness within families.

Holding on to Hope: Amin's Path From Silence to Sound

After years of limited access to specialised care, Amin was finally referred to the SAMS Cochlear Implant Program in northwest Syria. In addition to profound hearing loss, he lives with a progressive visual condition, making communication increasingly difficult for him and his family.

When doctors explained that his condition was consistent with Usher syndrome, his father remembers feeling overwhelmed.

"Waiting was extremely difficult for me," he said. "I felt a lot of anxiety and fear, knowing how complex the surgery would be. At the same time, I held on to hope that my son might finally be able to hear the sounds around him."

Amin had already tried hearing aids without benefit, and his speech remained delayed. Although he was older than the usual age for implantation, the SAMS team reviewed his case carefully and agreed to proceed.

The surgery was completed successfully at Bab al-Hawa Hospital. Testing during the operation showed strong responses, and Amin later returned for activation and the start of rehabilitation.

"This is my second child to receive a cochlear implant with SAMS,"* his father shared. *"I am very grateful for everything they have done for us. After the surgery, I felt relieved. Now I look forward to seeing my son learn to hear and speak, step by step."

Hearing-aid provision
Hearing aids remain the first line of support for many children, especially those with residual hearing. Through its clinics, SAMS provided approximately 500 pediatric **Oticon™ hearing aids** [21] during the program period. Fittings were conducted by trained audiologists using verification methods appropriate for children, and families received counselling to support consistent use at home. For some children, hearing aids offered meaningful access to sound and reduced the need for more invasive intervention. For others, limited benefit from amplification became part of the candidacy review for cochlear implantation.

Cochlear implantation
Only some of the children assessed as needing a device were able to move directly to implantation. Each referral was reviewed by SAMS case managers using criteria centered on age at presentation, confirmed bilateral sensorineural hearing loss, documented limited or absent benefit from hearing aids when appropriate, and medical readiness for surgery. Families were supported to complete the required steps, and priority was given to children for whom timely intervention was expected to offer the greatest developmental gain.

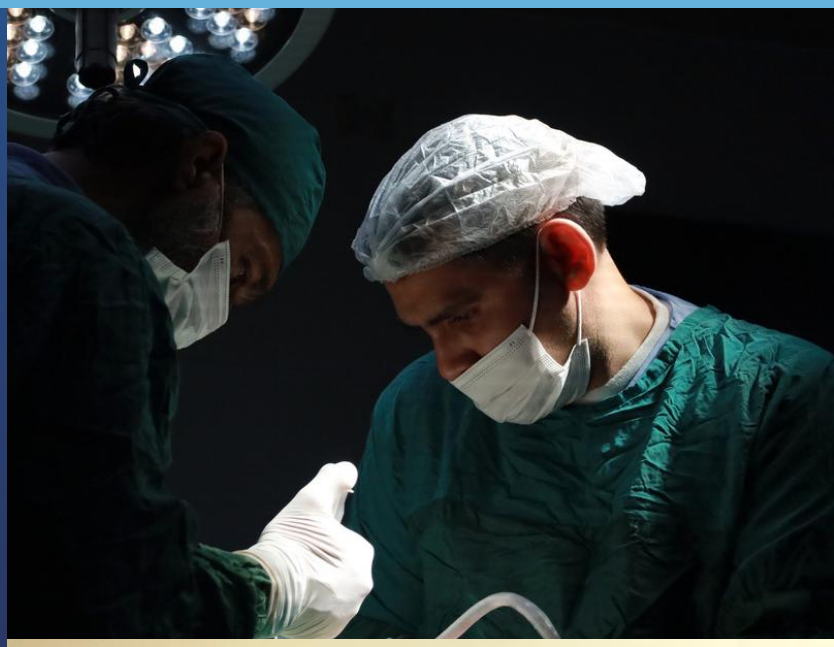
By the end of 2025, 83 cochlear implants had been performed at the SAMS surgical center in Bab al-Hawa Hospital. All cochlear implantations in this Programme used a **MED-EL SONATA®** 2 internal implant with a **SONNET® 2 audio processor**. [22] All operations were carried out by Syrian surgical teams, and no postoperative infections were recorded. Once healing had progressed, families returned for activation and the early programming sessions. These appointments involved gradual adjustments to the implant as children learned to interpret new sounds, and they required time, patience, and close involvement of caregivers. All programming and calibration sessions were provided with technical support from MED-EL throughout.

A Surgeon at the Heart of Childhood Hearing Care

Dr. Hamza Said Hasan is one of the few ENT surgeons in Syria with extensive hands-on experience in cochlear implantation for children. He is from Arbin, where he lived and worked throughout the years of conflict, including responding to the 2013 chemical attacks in Eastern Ghouta. These experiences shaped his commitment to children who require specialized, long-term hearing care.

As the clinical lead of the SAMS Cochlear Implant and Hearing Program, Dr. Hasan oversees every step of the pathway. He performs all implant surgeries supported by the program in northwest Syria and guides families through testing, activation and early programming. Under his leadership, SAMS has carried out 83 cochlear-implant surgeries in Syria, alongside additional cases supported in neighboring countries.

Families often describe him as a surgeon who takes time with each child, explains every stage clearly and shares in the joy of the first reactions to sound. Working closely with audiologists and rehabilitation teams, he continues to develop the program, managing increasingly complex cases and shaping the growing field of childhood hearing care across Syria.



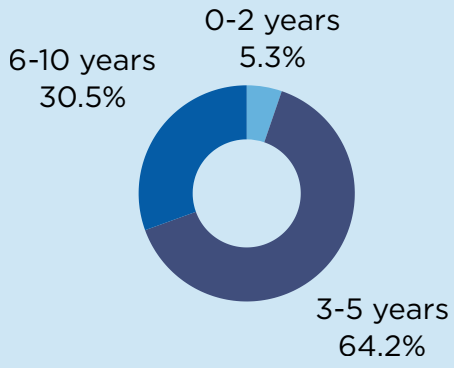
SAMS funded 78% of all implanted devices. The remaining 22% were supported either through private payment, largely among older patients outside eligibility criteria, or through contributions from partner organizations.

The implanted cohort was predominantly young. The median age at surgery was 4.34 years. Four children were under two years of age, and the largest group, 51 children (62%), were between two and five years old. A further 24 children (29%) were aged six to ten, with only a small number of older adolescents. A few patients aged fifteen years and above were from Damascus and Deir Ez-Zor after the political transition and chose to pay privately to undergo implantation within the SAMS pathway because services in their own governorates remained limited.

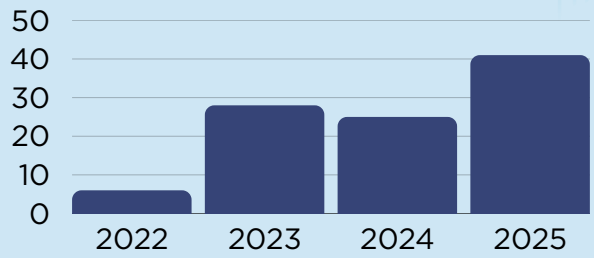
Implantation activity grew steadily as the Programme expanded. The earliest phase in 2022 accounted for 6% of all surgeries. As capacity increased and more families were able to reach the center, activity rose to 28% of all surgeries in 2023 and 25% in 2024. By 2025, nearly half of all procedures to date had been completed, with improved access and a growing reach of the Programme across the country. Most of the children who reached the surgical center were from Idlib, which accounted for about 47% of all beneficiaries, followed by Aleppo at 27%. Smaller numbers were from Homs (8%), Hama (5%), and Damascus (4%). A few families were from Deir Ez-Zor (3%), Raqqa (2%), Daraa (2%), and Rif Dimashq (1%). This wide distribution shows that families from across the country sought implantation with SAMS when comparable services were not available closer to home, often travelling long distances to secure care for their children.

Program Snapshot

Age distribution



Surgeries by year



The implanted devices were primarily funded by SAMS, which contributes **78% of total funding**.

Rehabilitations

Rehabilitation formed the essential next stage of care for children who received cochlear implants, as well as those using hearing aids. SAMS developed a structured programme based on auditory–verbal principles that included auditory recognition, sound discrimination, word building, speech production, and language comprehension. Sessions were delivered over several months by trained therapists and depended on consistent family involvement. The approach aligns with international guidance on early intervention and school-based support for implanted children.

Across SAMS sites, approximately 110 children who received cochlear implant surgeries participated in rehabilitation services delivered through four centers: Idlib Central Hospital and Termanin Hospital in Idlib Governorate, and Afrin Shifaa Hospital and Al-Bab Hospital in northern Aleppo. These children included SAMS cochlear-implant recipients as well as children implanted by other partners or in private facilities. Children attended an average of 14 sessions, with 51 children (46%) completing the full rehabilitation pathway. Individual sessions typically lasted between 30 and 45 minutes.

Therapists documented a series of small but meaningful gains shared by families during the course of therapy. Caregivers described children using hearing aids or therapy devices more consistently, allowing them to perceive sounds more clearly. Others reported new speech milestones, such as producing a previously difficult consonant, saying a first word, or forming a short sentence. Families also observed improved comprehension, with children responding more accurately to simple verbal instructions. Progress in articulation and pronunciation was noted by therapists, and many children became more engaged during sessions, showing greater confidence and participation. The table below summarises the main long-term goals of therapy and examples of short-term objectives addressed during sessions.

Long-Term Goal	Example Short-Term Objectives
Sound perception	Attend to environmental sounds and later to spoken words. Respond when asked to produce a specific sound. Show recognition of familiar words.
Speech comprehension and production	Understand and repeat simple words or phrases. Follow simple verbal instructions. Use targeted vocabulary in spontaneous speech.
Articulation	Produce specific consonants and vowels clearly. Practice difficult phonemes in isolation, syllables, and words. Reduce articulation errors in connected speech.
Strengthening speech organs	Perform exercises to strengthen the tongue, lips, and jaw. Improve oral–motor control (e.g., blowing, chewing, tongue elevation). Build endurance of speech muscles through repeated practice.

The Programme also invested in local capacity. Audiologists, speech and language therapists, and surgeons received mentoring from experienced colleagues through partnerships with My Right to Hear and MED-EL. This combination of structured pathways, data collection, and training makes the SAMS experience a useful reference for Syrian health authorities and partners designing a national cochlear implant strategy.

When Sound Entered Ghazal's World

Ghazal's journey began quietly, when her family noticed that she was not responding to sounds. She was three years old at the time. Hearing tests at a hospital in northern Syria confirmed significant hearing loss, and she was fitted with a hearing aid. She also began speech therapy at a rehabilitation center in Termanin. Despite repeated sessions, progress remained limited, and communication continued to be a daily challenge.

Over time, further evaluations showed that hearing aids alone were not enough. Cochlear implantation was recommended as the most appropriate option to help Ghazal access sound and develop speech.

In 2022, her family received news that she had been accepted into the SAMS Cochlear Implant Program at Bab al-Hawa Hospital, during the first phase of cochlear implant surgeries supported by SAMS. Medical preparations began immediately, including imaging and comprehensive preoperative assessments.

For Ghazal's father, the day of surgery was filled with tension. *"I lived through moments of intense anxiety while waiting outside the operating room,"* he said. *"When the doctors came out and told me the operation was successful, I felt an indescribable joy, as if life had returned to me once again."*

The surgery was completed successfully, and Ghazal later began the activation process and rehabilitation. Gradually, sound became part of her world. Today, she speaks, laughs, and goes to school alongside her peers.

Quiet Obstacles

Challenges and lessons for a whole-of-Syria hearing-care strategy
Implementing the SAMS Programme revealed several challenges that mirror those faced across Syria as hearing-care services begin to rebuild. These challenges are not unique to one region; they reflect broader national patterns that must be considered in developing a whole-of-Syria strategy:

A key concern is equity in early detection. Although the former national EHDI Programme aimed to introduce newborn screening more widely across hospitals, our records showed that nearly one thousand children with profound or severe hearing loss first present between three and five years of age in northern governorates, and some come much later. Many of these children had no earlier opportunity to seek assessment or treatment. Recent estimates from the current Ministry of Health suggest that more than four thousand people of different ages may still require intervention. A national strategy must therefore address two groups at once: newborns now entering the system and the older children and adolescents who were born during the conflict years and remain undiagnosed.

There is a need to expand and sustain technical skills. Surgical expertise in cochlear implantation remains limited; all SAMS surgeries to date were performed by a lead Syrian surgeon supported by a small team. The same constraints affect audiologists, speech therapists, and rehabilitation specialists. Strengthening pre-service and in-service training, supporting the next generation of clinicians, and creating opportunities for mentorship and hands-on learning will be essential for building a resilient national Program.

Another theme is the central role of rehabilitation. Medical research reveals that technology alone does not restore hearing function. Rehabilitation, consistent, family-centered, and long-term, is essential. Yet SAMS data show that only a fraction of children were enrolled in any form of rehabilitation at the time they were assessed. Although the former EHDI Programme listed multiple rehabilitation centers all over the country, the current status of many facilities and tools is unclear and requires an updated mapping of available assets and equipment. A whole-of-Syria approach requires a dense and coordinated network of rehabilitation services, linked to both public and charitable providers offering implants or amplification.

Coordination itself is another challenge. Various actors across Syria, including the Ministry of Health and humanitarian organisations, are now creating or expanding cochlear-implant and hearing-care programs. Without shared candidacy criteria, similar data collection tools, standardized follow-up, and compatible rehabilitation pathways, children may receive inconsistent care depending on where they live or which provider they reach. Establishing a technical committee or advisory group would help align these efforts and create a unified pathway that families can rely on.

Finally, financial protection is another concern. Even when devices are provided free of charge, families face transport costs, days away from work, and ongoing expenses for batteries, repairs, or replacement parts. Studies among refugees show that socioeconomic disadvantage can affect outcomes even after successful implantation, and similar patterns are likely within Syria unless social-protection mechanisms include families of children with hearing loss.

Tuning the way forward

Key recommendations for national action
The experience of the SAMS Programme, together with available national and international evidence, offers a practical set of recommendations for building a coordinated hearing-care system in Syria.

1. **Map existing early-detection capacity and rebuild what is functional:**
   After years of conflict and the recent political transition, many facilities that once participated in newborn screening have undergone major changes in staff, equipment, and overall function. A national plan should begin with a clear and systematic mapping of what remains. This includes identifying which hospitals still have hearing-screening devices, which centers retain trained personnel, and where the most urgent gaps now lie. Such an assessment should be led by the Ministry of Health, in close collaboration with health partners and the World Health Organization, ensuring that the mapping is comprehensive, coordinated, and aligned with international standards. The resulting baseline will guide the realistic restoration of early-detection services, helping rebuild a functional system without repeating past fragmentation.

2. **Plan device provision through sustainable and mixed financing:**
   SAMS' data show that children who meet cochlear-implant candidacy and those who require high-quality hearing aids appear in almost equal proportions. Meeting these needs requires planning based on realistic estimates of device numbers, operating costs, and long-term maintenance. In a setting with limited public resources, a shared financing approach involving the Ministry of Health, humanitarian organisations, families who can contribute, and external donors or corporate social responsibility partners can create a more stable procurement system for both implants and hearing aids.

3. **Integrate Rehabilitation and Education as Core Components of Care:**
   Rehabilitation remains essential for all children with hearing loss, whatever device they use. Structured programs with trained therapists, clear goals, and regular follow-up should be available across governorates, even if they begin through a phased or regional rollout. Links with early-childhood services and schools are equally important. Children make stronger progress when educational environments understand their needs. Collaboration with the Ministry of Education, UNICEF, and other education Humanitarian partners can support practical classroom strategies, teacher guidance, and pathways that help children participate fully in learning and daily school life.

4. **Adopt shared national assessment protocols and documentation standards:**
   Hearing assessments are currently carried out by several organisations using different tools and protocols. Without shared standards and compatible instrumentation, children may receive inconsistent evaluations. A basic national assessment protocol, combined with agreed-upon follow-up practices and documentation formats, would help create comparable data and more coherent referral pathways. Regional teams can adapt these tools to their context while keeping a unified national framework.

5. **Build workforce capacity through national training pathways:**
   Specialized expertise in ENT surgery, audiology, speech and language therapy, and special education remains limited. Strengthening national capacity will require training pathways, short courses, mentorship, and continuing professional development. Universities, professional associations, and experienced humanitarian programs should jointly support this pipeline, ensuring that service expansion is anchored in sustainable national capacity rather than temporary external deployments.

6. **Strengthen partnerships and harmonize ongoing initiatives:**
   Several organisations are already providing assessment, surgery, programming, and rehabilitation in different parts of Syria. Their experience offers important lessons. Stronger partnerships among these actors, coordinated by the Ministry of Health, can promote shared indicators, compatible data systems, and aligned referral pathways. Harmonizing existing initiatives can guide the development of a coherent, whole-of-Syria hearing-care system.

Moataz and the Sound That Changed His Family

"My joy is indescribable,"* Moataz's father said. *"His mother, his siblings, and I had been waiting for this moment for so long."

For Moataz's family, hearing loss was not experienced by one child alone. It shaped daily routines, conversations, and relationships within the household. His parents learned to repeat words, his siblings learned to wait, and communication became something the whole family worked toward together.

After multiple medical visits and hearing assessments, Moataz was diagnosed with severe hearing loss. Progress with speech was limited, and the effort required from the family grew over time. When he was four years old, the family was informed that he had been accepted into the SAMS Cochlear Implant Program. The decision came with hope, but also with the weight of long anticipation and practical challenges. Following surgery and the start of rehabilitation, changes emerged gradually. Family members noticed new responses to voices and sounds, and communication began to feel less strained. Small moments, shared words, clearer reactions, easier interaction, became part of everyday life.

For Moataz's family, the implant did not change only how one child hears. It reshaped how they speak to each other, how they wait for one another, and how they imagine the future together.

Conclusion

Syria is only starting to rebuild the pieces of a hearing-care pathway for children. Services remain uneven, screening is not yet routine in every maternity facility, and many families still arrive late with no earlier chance for assessment. The conflict years created a generation of children who were never screened, and thousands remain undiagnosed or without support.

The work described in this report shows that progress is possible even in difficult circumstances. SAMS teams documented more than sixteen hundred assessments and eighty-three cochlear-implant surgeries, all carried out inside the country, followed by rehabilitation that helped many children take their first steps toward speech. This is proof that organized pathways can be created, that families will come when services are available, and that trained Syrian professionals can deliver safe care.

Much still needs to be built. Older children born during the conflict continue to present for the first time at three to five years of age, and newborns entering the system now require a stronger foundation than currently exists. Yet the efforts seen across different actors offer a place to begin. With shared standards, practical coordination, and support for families, it becomes possible to move toward a system where a child living anywhere in Syria can be identified early, offered suitable care, and supported to develop language and participate fully in family and school life.

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