REPUBLIC OF TÜRKİYE
MINISTRY OF HEALTH

RARE DISEASES

HEALTH STRATEGY DOCUMENT AND ACTION PLAN

2023-2027

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PREAMBLE

Rare diseases refer to diseases with a prevalence of less than one per 2000 people in the community. Despite their low prevalence, 5–8% of the population has a rare disease, and millions of people worldwide are affected by these diseases. It is estimated that nearly 5–6.4 million people in Türkiye are affected by these diseases.

High mortality and disability rates are observed due to reasons such as difficulties in the diagnosis of these diseases, which are mainly of genetic origin, limited treatment options, and limited access to treatment for these diseases.

Parallel to global developments, efforts regarding rare diseases have been initiated by the Turkish Ministry of Health in many areas, including primary healthcare services, diagnosis, treatment, rehabilitation, and research. Therefore, a national health strategy document and action plan to deal with rare diseases are required for development and improved organization of existing services and planning of new services.

The "2023–2027 Rare Diseases Health Strategy Document and Action Plan" was prepared under the leadership of the Department of Autism, Mental Special Needs, and Rare Diseases in the Ministry of Health and with the contribution of all related stakeholders. This will guide future directions in this area. This guide is the product of comprehensive efforts and contains inclusive and multidimensional targets and actions addressing all public agencies and institutions, nongovernmental organizations, and citizens.

In the upcoming five years, efforts will focus on the prevention, diagnosis, and treatment of, as well as research on, rare diseases. Coordinated follow-up efforts and action plan implementation shall be carried out by all units with due diligence and within the framework specified herein. We will follow up on the implementation of all items included in the Rare Diseases Health Strategy Document and Action Plan and thorough fulfillment of responsibilities by related institutions.

Dr. Fahrettin KOCA
Republic of Türkiye Minister of Health

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ABBREVIATIONS

ERN	European Reference Networks
HSGM	General Directorate of Public Health
KHGM	General Directorate of Public Hospitals
NMD	Neuromuscular Diseases
ORPHANET	The Portal For Rare Diseases And Orphan Drugs
PGT	Pre-implantation Genetic Testing
RTÜK	Radio and Television Supreme Council
SBSGM	General Directorate of Health Information Systems
SHGM	General Directorate of Healthcare Services
SGGM	General Directorate of Health Promotion
SSI	Social Security Institution
SMA	Spinal Muscular Atrophy
NGO	Non-Governmental Organization
TITCK	Turkish Medicines and Medical Devices Agency
TÜBİTAK	Scientific and Technological Research Council of Türkiye
TÜSEB	Presidency of Turkish Health Institutes
TÜSKA	Turkish Healthcare Services Quality and Accreditation Institute
YHGM	General Directorate of Management Services
YÖK	Council of Higher Education

METHODOLOGY

The Rare Diseases Health Strategy Document and Action Plan (2023-2027) identified five main pillars with objectives, 42 targets materializing these objectives, and 44 actions to achieve these targets. Moreover, yearly plans were provided by tabulating the action plans for the next 5 years to achieve specified targets. Process indicators were created to follow up on the actions. Tables present process indicators for actions for the year using cumulative values, such as action completion rate and number of published guidelines, and yearly values for repeated actions, such as the number of annual meetings.

The first draft of this document was prepared by the Executive Committee considering the best practice examples observed and action plans created worldwide, opinions of field personnel, results of meetings with NGOs and industry representatives, EU Commission's Council Recommendation No. 2009/c 151/02 on an Action in the Field of Rare Diseases, the European Project for Rare Diseases National Plans Development (EUROPLAN), Recommendations for the Development of National Plans for Rare Diseases, previous efforts by the Ministry of Health, and nearly 200 meetings with relevant stakeholders, such as academicians and professional organizations.

Subsequently, opinions regarding the first draft were obtained from the relevant units of the Ministry of Health, stakeholder institutions, universities, NGOs, and industry representatives. The text was revised based on the feedback received and reviewed by the relevant units of the Ministry of Health from a legal perspective. Finally, the text was reviewed again by the executive committee, publishing coordinators, and publishing commission before being finalized.

The Rare Diseases Health Strategy Document and Action Plan covers short-term (one year), medium-term (1–3 years), and long-term (within 5 years) targets. The 2023–2027 healthcare action plan for rare diseases will be updated every five years based on national or international developments.

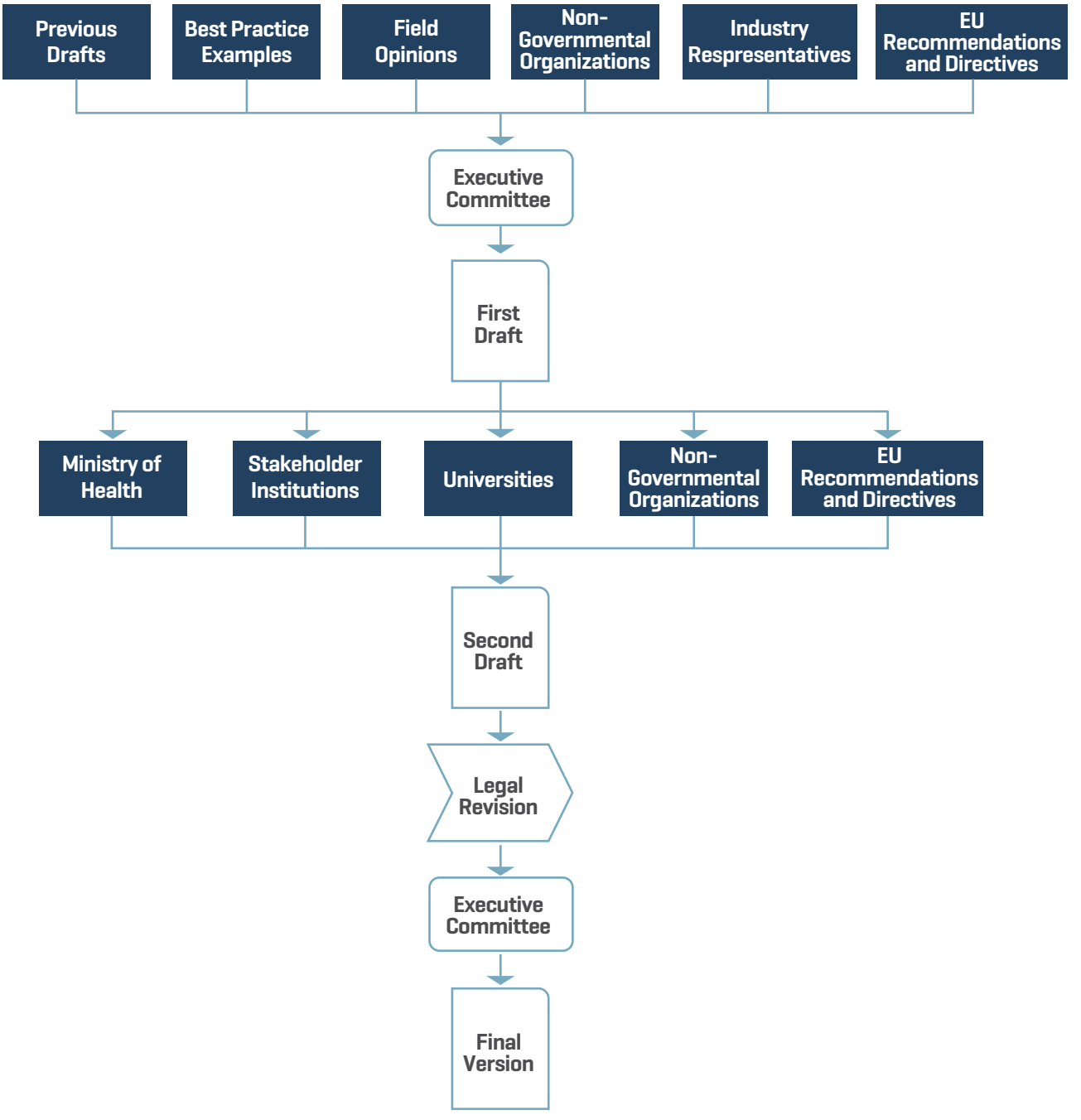

Figure 1: Rare Diseases: Health Strategy Document and Action Plan. Operating Methodology.

INTRODUCTION

Rare diseases refer to diseases with a prevalence of less than 1:2000. Although the number varies based on classification method, there are nearly 8000 rare diseases defined in the literature. It is estimated that 473 million people (5–8% of the global population) have rare diseases. In Türkiye, it is estimated that nearly 5–6.4 million people are affected by these diseases, and the incidence is higher in regions where consanguineous marriages are common.

As approximately 80% of rare diseases are of genetic origin, global action plans have generally focused on rare diseases of genetic origin. It is estimated that genetic diseases and congenital malformations account for a part of the perinatal mortality rate, reported as 10.6 per 1000 in 2020 in Türkiye. The 2005 European Conference on Rare Diseases report reviewed the life expectancy of 323 rare diseases and reported that 25.7% of the diseases were potentially lethal before 5 years of age, 36.8% had a reduced life expectancy compared to the normal lifespan, and 37.5% were associated with a normal lifespan.

High mortality and morbidity rates of these diseases are observed worldwide due to difficulties in the diagnosis of these diseases, insufficient number of trained specialists and diagnosis and treatment centers, limited treatment options, and limited access to treatment. This has forced many international organizations, such as the World Health Organization and the European Union, and national health authorities to set comprehensive strategies. Consequently, efforts for training specialized healthcare professionals have increased in many countries, including European countries and the United States, and diagnosis, treatment, and research centers have been established. Moreover, databases for epidemiological studies have been created, funding has been provided for trials to develop new treatments, at-risk group and newborn screenings have been widely employed, and efforts have been made to encourage orphan drug production. Statutory regulations are swiftly being implemented in countries with developed economies, including European Union countries.

Parallel to global developments, efforts to deal with rare diseases have been initiated by the local Ministry of Health in many areas, including primary healthcare services, diagnosis, treatment, rehabilitation, and research. A national health strategy document and action plan for rare diseases is required to develop and improve the organization of existing services and plan new services. The health strategy document and action plan for rare diseases aimed to identify their prevalence, facilitate access to healthcare services, improve quality of life, develop early diagnosis and treatment options, establish interventions to mitigate disease incidence, support scientific trials, and transform trial results into tools against rare diseases.

As with other rare disease action plans, action plans must be regularly updated, as the healthcare services in Türkiye are dynamic.

1 INCREASING AWARENESS AND KNOWLEDGE

Healthcare professionals in Türkiye may not have sufficient knowledge to meet the needs of patients with rare diseases. Education of healthcare professionals and developing and sharing best practices are top priorities in the field of rare diseases. Awareness and knowledge are the main determinants of timely and accurate diagnoses and high-quality treatment and care. Therefore, healthcare professionals, including general practitioners, primary care practitioners, and specialists that patients refer to in primary care, require access to reliable information on treatment options and methods.

Lack of awareness and knowledge among patients' families creates problems in disease management. People with rare diseases and their families require qualified information on the disease effects and course as well as guidelines for their respose. In addition, there is a general lack of awareness and knowledge in society.

1.1. Objective

Increase knowledge of rare diseases among patients, patient relatives, and healthcare professionals.

1.2. Targets and Actions

1.2.1. Target: Increase educational content for services regarding rare diseases to support the educational curriculum of all undergraduate and graduate programs, such as faculties, colleges, and institutes, in the field of health.

1.2.1.1. Action:

A) Establish the Rare Diseases Education Commission;

B) Ensure that the Commission prepares a proposal on educational content covering topics such as the most common rare diseases in Türkiye, guidance of people with these diseases, and channels of access to information on these rare diseases;

C) Deliver the educational content proposal to the relevant units in institutions of higher education;

D) Make efforts for broad implementation of this content to reach the target audience.

1.2.2. Target: Organize targeted training activities regarding rare diseases for physicians.

1.2.2.1. Action:

A) Transform the content defined in 1.2.1.1 and prepared by a scientific board into a distance training module for primary care practitioners and relevant major specialists, including pediatricians and internal medicine specialists.

B) Ensure that offline training activities are delivered to the target group.

1.2.3. Target: Develop evidence-based clinical practice and patient guidelines on rare diseases and provide access to documents.

1.2.3.1. Action:

A) Retrieve and process data from existing registry systems to identify common rare diseases;

B) Identify common rare diseases that can be cured through early treatment or prevention and establish scientific committees in relation to these diseases;

C) Prepare national standard diagnosis and treatment guidelines and patient guides for these diseases.

1.2.4. Target: Prepare a website for professionals, patients, and patient relatives and provide information. such as disease description, diagnosis centers, counseling opportunities, and treatment options.

1.2.4.1. Action:

A) Complete Orphanet Türkiye doctor and patient information pages;

B) Introduce these pages to primary care practitioners, relevant specialists, and healthcare providers involved in the diagnosis and follow-up process;

C) Follow up on the physicians' use of the system.

1.2.5. Target: Ensure that patients and their relatives have access to reliable and correct information.

1.2.5.1. Action:

A) Announce the issue to the stakeholders to raise awareness of Orphanet Türkiye and organize patient and NGO meetings on patient access to Orphanet Türkiye page in collaboration with stakeholders, such as health authorities, professional organizations, patient associations, and industries in the field of rare diseases;

B) Follow up on the use of Orphanet Türkiye.

1.2.6. Target: Increase awareness of premarital carrier screenings.

1.2.6.1. Action:

A) Ensure that the relevant scientific board prepares brochures on premarital carrier screenings;

B) Ensure that these brochures are delivered to and distributed in primary healthcare institutions and relevant governmental agencies and institutions;

C) Prepare public service announcements, documentaries, or visual content recommended by the Radio and Television Supreme Council to be broadcast in audio-visual media.

1.2.7. Target: Increase awareness of rare diseases among media agencies and organizations.

1.2.7.1. Action: Organize regular, such as biannual, meetings with media members to help media agencies obtain and report informed and ethical news on rare diseases.

2 SUPPORTING PATIENTS AND THEIR RELATIVES AND INCREASING PATIENT QUALITY OF LIFE

Patients with rare diseases and their relatives encounter many problems during the disease process. It is important to support patients and their relatives in overcoming psychological, social, and economic problems in addition to the intrinsic challenges due to the nature of the disease. Therefore, patients with rare diseases and their relatives should be included in the process of overcoming challenges in diagnosis, treatment, and access to healthcare services. Patient organizations, such as NGOs, ensure that patients and their relatives do not feel isolated and can serve as an instrument in providing professional advice and support by employing physicians, nurses, and lawyers.

2.1. Objective

Provide appropriate guidance and support for people with rare diseases and their relatives in overcoming psychological, social, and economic problems.

2.2. Targets and Actions

2.2.1. Target: Evaluate the challenges directly experienced by people with rare diseases and their relatives in diagnosis, treatment, and access to healthcare services.

2.2.1.1. Action: Evaluate the experiences and challenges of patients using tools such as questionnaires, semi-structured interview and structured interviews, direct observation, and stakeholder opinions to identify the healthcare services that need to be improved.

A) Develop information tools;

B) Ensure the distribution of information tools in collaboration with patient and professional organizations;

C) Data analysis and reporting;

D) Assess solution possibilities.

2.2.2. Target: Ensure collaboration in the identification and resolution of problems in coordination with patient organizations, such as NGOs.

2.2.2.1. Action: Organize routine meetings (four times per month) with patient associations and professional organizations.

2.2.3. Target: Strengthen the communications between patients, their relatives, and healthcare professionals, provide patients and their relatives access to support groups, and ensure that they are informed regarding protection, treatment options, and scientific research on diseases.

2.2.3.1. Action: Organize meetings (bimonthly) with representatives of patient associations, professional organizations, and the Ministry of Health, focusing on a single disease group per meeting.

2.2.4. Target: Develop informative and guiding documents and online information regarding public resources and social services that can be accessed by patients during the treatment process.

2.2.4.1. Action: Increase knowledge of healthcare and social services among service providers.

A) Ensure that standard training activities are prepared by the Rare Diseases Education Commission and prepare a distance education program on rare diseases, the course of common rare diseases, their psychological effects, and public resources and social services that can be accessed by patients through distance education for healthcare institutions and relevant social services involved;

B) Deliver training to field personnel;

C) Increase the number of patients receiving support.

2.2.5. Target: Provide psychological support, social support, and counseling services and develop self-help groups to deal with negative feelings, such as stress, fear, guilt, and loneliness, and challenges, such as social isolation, of the diseases.

2.2.5.1. Action: Ensure that patients benefit from mental health services.

A) Prepare training and group activities on topics such as mental health problems likely to be encountered by patients with rare diseases and their relatives, coping skills, and availability of mental health services;

B) Deliver training activities to families in collaboration with patient and professional organizations.

2.2.6. Target: Develop remote psychological support, social support, and counseling services to help patients and their relatives cope with the psychological problems entailed by the disease.

2.2.6.1. Action: Develop a remote healthcare service mobile application for psychosocial support purposes.

A) Build technical infrastructure;

B) Provide personnel employment and equipment;

C) Perform pilot applications;

D) Ensure broad implementation of the service.

3 DIAGNOSIS AND PREVENTION OF RARE DISEASES

3.1. Role of Healthcare Professionals in Primary Healthcare Institutions in Diagnosis

Delays in the diagnosis of rare diseases create the risk of timely effective treatments being missed. In some cases, diagnosis may be delayed despite apparent symptoms. Diagnosis of a rare disease depends on the physician specialized in this field and performance of laboratory tests specific to the disease. Although medical education includes rare diseases, it is not possible for physicians in primary healthcare institutions, who encounter rare diseases for the first time, to correctly diagnose all rare diseases. Therefore, in the event of a suspicion of a rare disease, it is important to timely and accurately refer patients to the relevant specialist or healthcare institution specialized in their field.

3.1.1. Objective

Initiate diagnostic processes for patients referring to primary healthcare institutions at an early stage.

3.1.2. Targets and Actions

3.1.2.1. Target: Ensure that physicians working in primary healthcare institutions have the required knowledge and skills to correctly refer the patient to the relevant specialist or healthcare institutions if deemed necessary.

3.1.2.1.1. Action:

A) Establish an inventory of physicians handling rare diseases;

B) Build the infrastructure to direct patients to physicians specialized in their fields;

C) Integrate the infrastructure with Orphanet Türkiye;

D) Ensure that primary care practitioners have access to and use this information infrastructure.

3.2. Expanded Newborn Screening

Some rare diseases manifest symptoms in the neonatal period and appear due to genetic reasons or exposures during the pregnancy process. Early diagnosis and consequent early treatment are of great importance in the prevention of complications of congenital diseases. Within the scope of the Newborn Screening Program implemented in Türkiye, newborn babies are screened for phenylketonuria, congenital hypothyroidism, biotinides deficiency, cystic fibrosis, and congenital adrenal hyperplasia. Spinal muscular atrophy (SMA) has been added to the panel of the program as of 2022.

3.2.1. Objective

Expand the newborn screening program based on scientific evidence and shorten the reporting period of the results to the families whose babies are found positive in the current screening programs.

3.2.2. Targets and Actions

3.2.2.1. Target: Expand and maintain screening programs.

3.2.2.1.1. Action:

A) Establish an executive committee comprising the heads of relevant departments from the General Directorate of Public Health, TÜSEB, General Directorate of Healthcare Services, and General Directorate of Public Hospitals (i.e., the relevant units of the Ministry of Health) for efforts toward expansion and maintenance of screening programs;

B) Ensure that scientific evidence, plot studies, and economic outputs are evaluated by the "Rare Diseases Screening Scientific Committee" comprising subject matter experts assigned by the executive committee. Ensure that an evidence-based decision algorithm is developed to review available evidence on diseases that may be included in the newborn screening program in terms of disease, diagnostic testing, treatment options, efficiency, and acceptability of screening programs. Evaluate screening program benefits, cost efficiency, and identification of diseases;

C) Ensure that the relevant committee and scientific board evaluate the existing screening programs according to the established algorithm at regular intervals, such as biannual, and make recommendations on screening programs that may be implemented for diseases excluded from the program by reviewing the evidence;

D) Conduct pilot studies for planned tests when deemed necessary.

3.2.2.2. Target: Increase knowledge and skills among relevant specialist physicians and laboratory staff with interventional competencies under the Medical Specialization Training Core Curriculum to expand the newborn screening program.

3.2.2.2.1. Action:

A) Develop standard training activities to harmonize activities among relevant specialist doctors and laboratory staff with interventional competencies under the Medical Specialization Training Core Curriculum and primarily responsible for the currently ongoing screening efforts;

B) Ensure that relevant specialists and laboratory staff benefit from training activities.

3.2.2.3. Target: Improve the diagnosis, treatment, and follow-up processes of patients with suspicion in screening tests.

3.2.2.3.1. Action: Increase the number of major and minor specialists and well-equipped assistant healthcare providers involved in the diagnosis, treatment, and follow-up and ensure broad implementation across Türkiye based on needs.

A) Identify the current situation and create projections regarding relevant healthcare staff;

B) Create plans to ensure proper distribution;

C) Follow up on the increase in the number of healthcare staff and their distribution compared to the current projection.

3.2.2.3.2. Action: Build the necessary infrastructure to ensure access to relevant specialists through remote healthcare services in required areas to improve the quality and accessibility of follow-up and treatment services.

A) Ensure the follow-up of the post-screening processes by establishing responsible teams comprising relevant major specialists and coordinators from the organization of the Ministry of Health in individual provinces;

B) Design and establish a follow-up system for remote healthcare services for each disease and provide training activities for pediatricians, pediatric nurses, public health nurses, relevant major specialists, minor specialists, and coordinators included in the system;

C) Make the pilot application;

D) Ensure broad implementation across Türkiye.

3.2.2.4. Target: Minimize the maximum turnaround time between sampling for newborn screening and reporting to the families of babies with positive results.

3.2.2.4.1. Action:

A) Determine the current period;

B) Identify rate-limiting factors;

C) Determine the target period;

D) Take measures;

E) Report the result annually.

3.2.2.5. Target: Develop local diagnostic kits.

3.2.2.5.1. Action:

A) Determine the current situation and target kits;

B) Provide project support for the development of local diagnostic kit;

C) Provide advisory services in the transformation of projects into products;

D) Make the kits available for use.

3.3. Carrier Screening

When it is unknown which parent is the carrier of a rare genetic disease, recessive hereditary rare diseases occur as a result of the child inheriting the relevant genes from both parents. Carrier screening involves the testing of people known to be at high risk of being carriers of a specific hereditary disorder. However, screenings can be performed for diseases commonly observed in the population. In Türkiye, thalassemia screening is

performed to this effect for couples before marriage. It is recommended that carrier screening made especially for recessive hereditary diseases should be applied to groups known to have a high incidence of carrying the related genes, such as Ashkenazi Jews and Tay Sachs disease. Due to the high carriage rates in Türkiye, all premarital couples have been subjected to SMA carrier screening as of December 2021.

3.3.1. Objective

Perform carrier screening of individuals with a high risk of carrying rare genetic diseases and of the genes associated with genetic rare diseases occurring with a high prevalence in the population.

3.3.2. Targets and Actions

3.3.2.1. Target: Determine the prevalence of the genes associated with rare genetic diseases observed through pilot studies.

3.3.2.1.1. Action:

A) Ensure that the Rare Diseases Screening Scientific Committee identifies the diseases requiring prevalence studies and prepares the relevant study plan;

B) Provide a financial infrastructure;

C) Complete studies and share the results with relevant agencies and institutions.

3.3.2.2. Target: Ensure that the diseases deemed necessary by the Rare Diseases Screening Scientific Committee are included within the scope of the carrier screening program and screened with appropriate methods.

3.3.2.2.1. Action:

A) Ensure that the decision-making algorithm specific to carrier screening is developed by the Rare Diseases Screening Scientific Committee. This includes evaluation of the incidence of the genes associated with the disease, severity of the disease, scientific evidence, economic outputs, treatment options, and efficiency and acceptability of the planned screening program;

B) Share the decisions taken based on the established algorithm with the relevant agencies and institutions.

3.3.2.3. Target: Broadly implement and increase the quality of genetic counseling service when required, such as in risky marriages.

3.3.2.3.1. Action:

A) Develop genetic counseling training programs;

B) Prepare genetic counseling standard guidelines.

3.3.2.4. Target: Improve the knowledge and skills of existing specialists to effectively provide pre-implantation genetic diagnosis (PGT) services.

3.3.2.4.1. Action:

A) Organize in-service training programs for medical genetics and pediatric genetics specialists in the public sector;

B) Ensure that there are medical and pediatric genetic disease specialists that can perform PGT in each upper healthcare service region and provide the necessary infrastructure opportunities for these specialists.

3.4. Cascade Testing

Cascade testing involves the testing of relatives that are at risk for a genetic disease. When used effectively, these tests can reduce morbidity and mortality.

3.4.1. Objective

Identify the relatives with the relevant gene of individuals found to have the hereditary and potentially fatal disease and provide protective measures for these individuals.

3.4.2. Targets and Actions

3.4.2.1. Target: Screen the relatives of the individuals found to have a hereditary disease that may potentially lead to disability and death, such as Long QT Syndrome, for the relevant genetic disease and take necessary preventive or therapeutic measures, such as medication and implantable defibrillators, for individuals found to have the associated genetic disease.

3.4.2.1.1. Action:

A) Ensure that the diagnoses meeting the definition are identified by the Rare Diseases Screening Scientific Committee;

B) Identify the individuals with the specified diagnoses and their family members through family screening and plotting family trees;

C) Ensure qualified and continuous follow-up of these patients by sending notices to their primary care practitioners;

D) Provide genetic counseling services to patients by reaching the relevant individuals through the responsible primary care practitioner and direct them to the appropriate centers;

E) Prepare a report on the number of patients reached per year.

3.5. Pre-Conception and Prenatal Care

Some congenital diseases can be prevented through pre-conception and prenatal care.

3.5.1. Objective

Prevent the congenital diseases caused by a lack of pre-conception and prenatal care and exposure to various pathogens.

3.5.2. Targets and Actions

3.5.2.1. Target: Prevent exposure to harmful products and pathogens before and during pregnancy by explaining potential risks to mothers and take measures deemed necessary, such as pre-conception rubella vaccination, folic acid supplementation, and environmental arrangement.

3.5.2.1.1. Action:

A) Identify fetal development risk factors to be targeted;

B) Prepare information resources related to target risk factors;

C) Report fetal development risk factors for rare diseases during pregnancy to all couples registered in primary care within the scope of premarital screening.

3.6. At-Risk Population Screening

Most rare diseases present with disease-specific symptoms. These patients are often under- or misdiagnosed. Screening should include referral of patients with chronic renal failure of unknown cause or misdiagnosis for disease-specific testing to reveal the underlying rare disease.

3.6.1. Objective

Identify undiagnosed individuals.

3.6.2. Targets and Actions

3.6.2.1. Target: Perform symptom-based screening of individuals with possible undiagnosed rare diseases.

3.6.2.1.1. Action:

A) Ensure that the Rare Diseases Screening Scientific Committee identifies the rare diseases that can be detected based on the symptoms and risk groups for these diseases as target groups;

B) Identify at-risk individuals;

C) Take protective measures, provide appropriate treatment, provide genetic counseling to the family when needed, and apply cascade testing.

4 TREATMENT AND CARE SERVICES

4.1. General Treatment and Care Services

Some of the rare diseases require multiple fields of expertise entailing a multidisciplinary and team approach. Evidence-based care plans for patients post-diagnosis are required. In addition, it is important to establish specialized service units and centers of excellence that patients can be referred to when needed. Thus, the highest level of knowledge, experience, and capacity should be made available for the benefit of patients.

4.1.1. Objective

Provide patients with effective, accessible, and patient-specific treatment and care services.

4.1.2. Targets and Actions

4.1.2.1. Target: Develop evidence-based well-defined care plans outlining the expected course of diseases and establishing the responsibilities of primary, secondary, and tertiary healthcare institutions and healthcare professionals providing care services in these institutions.

4.1.2.1.1. Action:

A) Establish disease-specific scientific boards for at least five rare diseases, to be determined based on their priority;

B) Ensure that standard treatment and care protocols are developed by the relevant scientific boards;

C) Conduct field-oriented training activities for each protocol.

4.1.2.2. Target: Provide remote healthcare and information technologies services to allow the physicians and healthcare providers in the relevant field of specialty to coordinate care.

4.1.2.2.1. Action:

A) Create remote healthcare service infrastructure in secondary and tertiary pilot healthcare institutions;

B) Designate responsible physicians for each province from and among minor specialists working in the other regions of the country, who will be contacted when needed in regions with geographically limited access to minor specialists or insufficient number of specialists. Develop remote healthcare and consultation services;

C) Ensure patient follow-up through coordination of provincial teams established under clause 3.2.2.3.2 and minor specialists responsible for the relevant province;

D) Broadly expand the practice to the field.

4.1.2.3. Target: Establish specialized service units in accordance with the specified standards to produce rapid and specific medical services for individuals with rare diseases.

4.1.2.3.1. Action:

A) Increase the number of NMD service units to 20;

B) Establish a specialized pilot service unit in each upper healthcare service region for at least two rare diseases to be identified, in addition to NMD service unit;

4.1.2.4. Target: Support existing centers guiding Türkiye's policies and scientific researches dealing with rare diseases in a multidisciplinary manner to turn into Centers of Excellence.

4.1.2.4.1. Action:

A) Inventory rare disease applications and research centers;

B) Remedy the deficiencies of the relevant centers based on the TÜSKA center of excellence infrastructure;

C) Ensure domestic and international coordination of candidate centers of excellence, including ERN memberships.

4.1.2.5. Target: Ensure that the centers of excellence established share knowledge, experience, and expertise with other hospitals, service units, centers, primary healthcare teams, social care and training teams, and home care services in the field.

4.1.2.5.1. Action:

A) Open centers of excellence;

B) Support and ensure the coordination of the training and services to be provided.

4.2. Biological Drugs and Genetic and Cellular Therapies in the Treatment of Rare Diseases

Early diagnosis of rare diseases is essential to provide patients with timely and effective treatment and care services. Biological medicine and genetic and cellular therapies are currently used in the treatment of rare diseases. The high cost of these treatments necessitates the development of gene therapies in Türkiye. This requires trainingfor local scientists in the field or recruiting scientists in Türkiye. An infrastructure for development of biological medicine and genetic and cellular therapies is required.

4.2.1. Objective

Ensure that medicine developed for the treatment of rare diseases is used in the treatment of patients considering scientific evidence and that high-tech medicine used in the treatment of rare diseases, such as gene therapy, is produced in Türkiye. Establish certified specialized centers where these treatments can be administered to patients and build and establish the necessary infrastructure.

4.2.2. Targets and Actions

4.2.2.1. Target: Develop national orphan drug legislation considering international legislation and support decisions based on legislation and scientific procedures and models to provide individuals with rare diseases access to treatment. Evaluate new treatments.

4.2.2.1.1. Action:

A) Establish a scientific board to evaluate the cause-based treatments of rare diseases (orphan drugs);

B) Conduct scientific studies regarding orphan drug legislation and decision models;

C) Develop legislation, such as registration, pricing, and reimbursement, regarding orphan drugs containing guidelines to accelerate patients' access to treatment, including treatments not available in Türkiye. Identify priority categories and determine the intellectual property concept for orphan drugs to ensure high-priority and rapid evaluation in the registration processes;

D) Develop scientific procedures and decision models;

E) Ensure that the newly developed treatments are evaluated by the relevant scientific board in accordance with the orphan drugs legislation, using previously established procedures and decision models and considering the level of scientific evidence, patient needs and disease burden, benefits and side effects, and the cost-efficiency of the treatment. Make approved treatments available for use;

F) Establish certified specialized centers, with high-tech products, such as gene therapy, approved by the scientific board administered to patients.

4.2.2.2. Target: Achieve the European average in terms of availability of new treatment options in the field of rare diseases.

4.2.2.2.1. Action:

A) Evaluate the current situation in Türkiye compared to other countries;

B) Identify barriers to access to treatment;

C) Make efforts to overcome the identified barriers.

5 RESEARCH AND DEVELOPMENT ACTIVITIES

5.1. Increasing the Level of Evidence (National Rare Diseases Data System)

Epidemiological, clinical, and economic data on rare diseases are valuable resources for planning healthcare services. With the acquisition of clinical data on rare diseases, short- and long-term clinical courses of many diseases can be elaborated, and precautionary plans can be created. Identification of the health and social care needs associated with rare diseases, determination of the budget to be allocated for patient services, and planning and implementation of services can be performed in an evidence-based manner.

5.1.1. Objective

Collect epidemiological, clinical, and economic data on rare diseases and use these data to plan healthcare services and determine measures and interventions for diagnosis and treatment.

5.1.2. Targets and Actions

5.1.2.1. Target: Collect incidence and prevalence data of rare diseases through epidemiological studies.

5.1.2.1.1. Action:

A) Draw the distribution map of rare diseases in Türkiye considering studies specified in activities no. 3.3.2.1. and 1.2.3.1.,

B) Interpret the epidemiological, clinical, and economic data and share the results with the decision-making authorities and institutions on the relevant matters.

5.1.2.2. Target: Establish a national rare diseases data system.

5.1.2.2.1. Action:

A) Establish a data system;

B) Collect data meeting the principles of findability, accessibility, interoperability, and reusability (FAIR) using the data system to be established;

C) Ensure the financial and operational sustainability of the data system;

D) Integrate the established data system into existing patient registry systems;

E) Organize a workshop on data sharing with relevant authorities and institutions, Ministry of Health, professional organizations, and NGOs, including patient organizations and associations representing the industry.

5.1.2.3. Target: Identify the scientists working in the field of rare diseases.

5.1.2.3.1. Action

A) Create an inventory of scientists working in this field;

B) Publish the inventory and update it on an annual basis.

5.2. Diagnosis and Treatment Efforts

The main goal of trials on rare diseases is to improve diagnosis and treatment. Development of local products, such as diagnostic kits and cellular and gene therapies, is warranted to effectively provide diagnosis and treatment opportunities in Türkiye. For further development of drug discoveries in this field, multidisciplinary close collaboration is required at all stages of translational research (research on practical applications of basic research). Furthermore, information from patients and their families may increase the quality and efficiency of research and trials.

5.2.1. Objective

Support research and trials on diagnosis and treatment of rare diseases and ensure that research and trial results are transformed into products that will be used in diagnosis and treatment.

5.2.2. Targets and Actions

5.2.2.1. Target: Establish biobanks for sampling in rare diseases. Encourage the use of existing biobanks to this end and ensure sustainability.

5.2.2.1.1. Action:

A) Inventory existing biobanks;

B) Develop collaboration protocols for biobanks that may be suitable for rare disease trials.

5.2.2.2. Target: Support preclinical trials.

5.2.2.2.1. Action:

A) Provide laboratories, necessary physical infrastructure facilities, and human resources for biological medicine and gene and cellular therapies;

B) Make suitable centers available for common use;

C) Open calls for projects specific to rare diseases;

D) Provide support for project writing and coordination and ensure international competitiveness.

5.2.2.3. Target: Develop diagnostic and screening tests.

5.2.2.3.1. Action:

A) Organize a workshop with stakeholders to identify the existing human resources and infrastructure in Türkiye;

B) Encourage the local production of tests used for diagnosis and screening and open and support project calls;

C) Establish a consortium for transformation of the developed diagnostic tools into products through public-private collaboration.

5.2.2.4. Target: Support and establish infrastructure for trials, including Phase 1 studies.

5.2.2.4.1. Action:

A) Provide infrastructure and staff support for centers with Good Clinical Practice (GCP) certification and increase the competencies of personnel in these units for studies on rare diseases;

B) Announce trials to be conducted on the "Clinical Trials Portal";

C) Inspect centers twice per year.

5.2.2.5. Target: Develop biopsychosocial support projects for patients and their relatives.

5.2.2.5.1. Action:

A) Organize meetings twice per year in collaboration with the Ministry of Family and Social Services and with the attendance of relevant stakeholders to support patient participation in projects to improve their quality of life and increase their engagement in social and economic life. Enable patients to benefit from social rights, such as education, transportation, and employment as granted to chronic patients;

B) Follow up on the reflection of the impact of meetings on patients' lives using surveys and questionnaires containing patient opinions;

C) Evaluate survey results by sharing them with relevant authorities/institutions and NGOs.

5.2.2.6. Target: Identify and support scientists conducting research and trials for local development of gene therapies, biological medicine, cellular therapies, and high-tech products in Türkiye. Produce facilities to undertake production, train new scientists in this field, or recruit scientists from abroad to Türkiye. Provide infrastructure facilities required for development of medicine.

5.2.2.6.1. Action:

A) Establish a coordination board for gene therapies, biological medicine, cellular therapies, and high-tech products;

B) Prepare a country report on gene therapies, biological medicine, cellular therapies, and high-tech products;

C) Provide necessary infrastructure for the development of treatment methods and required medicine;

D) Provide project support for the development of innovative methods, such as gene therapies, biological medicine, cellular therapies, and high-tech products;

E) Evaluate the opportunities for collaboration with the pharmaceutical industry and support production-oriented activities of companies that can advance in this field;

F) Develop required treatment methods and medicine through collaboration with international centers;

G) Perform analyses on separate reimbursement models in case of local development of relevant treatments.

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TABLES

Note: Process indicators have been created for follow-up on actions defined for targets. In the Tables, process indicators listed under the year headings are expressed with cumulative values for most of the actions, such as action completion rate and number of published guidelines, and with yearly values for repeated actions, such as number of annual meetings.

1.Increasing Awareness and Knowledge							
1.2.1. Target: Increase the educational content for services regarding rare diseases to support the educational curriculum in the faculties and institutes of medicine and health sciences							
Actions	**Responsible and Collaborating Agency/ Institution**	**Process Indicator**	**2023**	**2024**	**2025**	**2026**	**2026**
1.2.1.1. A) Establish the Rare Diseases Education Commission (10%) B) Ensure that the Commission prepares a proposal on educational content covering the topics such as the most common rare diseases in Türkiye, guidance of people with these diseases, and channels of access to information on these rare diseases (40%) C) Deliver the educational content proposal to the relevant units in institutions of higher education (25%) D) Make efforts for broad implementation of this content to reach the target audience (25%)	**Responsible Agency/ Institution:** SHGM **Stakeholders:** YÖK	Action completion rate (%)	20	50	75	90	100

1. Increasing Awareness and Knowledge							
1.2.2. Target: Organize targeted training activities on rare diseases for physicians							
Actions	**Responsible and Collaborating Agency/ Institution**	**Process Indicator**	**2023**	**2024**	**2025**	**2026**	**2027**
1.2.2.1. A) Transform the content defined in 1.2.1.1 and prepared by a scientific board into a distance training module for primary care practitioners and relevant major specialists, including pediatricians and internal medicine specialists(50%) B) Ensure that offline training activities are delivered to the target group (50%)	**Responsible Agency/ Institution:** SHGM HSGM **Stakeholders:** Relevant Professional Organizations Universities	Percentage of completion of training by Primary Care Practitioners and major specialists (Number of physicians that received the training / Number of Primary Care Practitioners and major specialists)	Preparation process of the training and module in clause 1.2.1.1	Preparation process of the training and module in clause 1.2.1.1	30	65	100
1.2.3. Target: Develop evidence-based clinical practice and patient guidelines on rare diseases and provide access to documents							
1.2.3.1. A) Retrieve and process data from existing registry systems to identify common rare diseases B) Identify common rare diseases that can be cured through early treatment or prevention and establish scientific committees in relation to these diseases C) Prepare national standard diagnosis and treatment guidelines and patient guides for these diseases	**Responsible Agency/ Institution:** SHGM TÜSEB **Stakeholders:** SGGM HSGM KHGM Universities Relevant Professional Organizations	Total number of published guidelines and guides	2	4	6	8	10

1.Increasing Awareness and Knowledge							
1.2.4. Target: Prepare a website for professionals, patients, and patient relatives and provide information. such as disease description, diagnosis centers, counseling opportunities, and treatment options							
Actions	**Responsible and Collaborating Agency/ Institution**	**Process Indicator**	**2023**	**2024**	**2025**	**2026**	**2027**
1.2.4.1. A) Complete Orphanet Türkiye doctor and patient information pages (50%) B) Introduce these pages to primary care practitioners, relevant specialists, and healthcare providers involved in the diagnosis and follow-up process (25%) C) Follow up on the physicians' use of the system (25%)	**Responsible Agency/ Institution:** TÜSEB **Stakeholders:** SHGM HGSM Universities Relevant Professional Organizations	Action completion rate (%)	20	50	75	90	100
1.2.5. Target: Ensure that patients and their relatives have access to reliable and correct information							
1.2.5.1. A) Announce the issue to the stakeholders to raise awareness of Orphanet Türkiye and organize patient and NGO meetings on patient access to Orphanet Türkiye page in collaboration with stakeholders, such as health authorities, professional organizations, patient associations, and industries in the field of rare diseases (50%) B) Follow up on the use of Orphanet Türkiye (50%)	**Responsible Agency/ Institution:** TÜSEB **Stakeholders:** SGGM HSGM SHGM Relevant Professional Organizations NGO	Action completion rate (%)	Completion of the clause 1.2.4.1 A	Completion of the clause 1.2.4.1 A	50	75	100

1.Increasing Awareness and Knowledge							
1.2.6. Target: Increase awareness of premarital carrier screenings							
Actions	**Responsible and Collaborating Agency/ Institution**	**Process Indicator**	**2023**	**2024**	**2025**	**2026**	**2027**
1.2.6.1. A) Ensure that the relevant scientific board prepares brochures on premarital carrier screenings (30%) B) Ensure that these brochures are delivered to and distributed in primary healthcare institutions and relevant governmental agencies and institutions (20%) C) Prepare public service announcements, documentaries, or visual content recommended by the Radio and Television Supreme Council to be broadcast in audio-visual media (50%)	**Responsible Agency/ Institution:** HSGM **Stakeholders:** Universities RTÜK SGGM	Action completion rate (%)	30	50	75	100	100
1.2.7. Target: Increase awareness of rare diseases among media agencies and organizations							
1.2.7.1. Organize regular, such as biannual, meetings with media members to help media agencies obtain and report informed and ethical news on rare diseases	**Responsible Agency/ Institution:** Ministry of Health Office of Press Counselor **Stakeholders:** SHGM RTÜK	Number of annual meetings	2	2	2	2	2

2. Supporting Patients and Their Relatives and Increasing Patient Quality of Life							
2.2.1. Target: Evaluate the challenges directly experienced by people with rare diseases and their relatives in diagnosis, treatment, and access to healthcare services							
Actions	**Responsible and Collaborating Agency/ Institution**	**Process Indicator**	**2023**	**2024**	**2025**	**2026**	**2027**
2.2.1.1. Evaluate the experiences and challenges of patients using tools such as questionnaires, semi-structured interview and structured interviews, direct observation, and stakeholder opinions to identify the healthcare services that need to be improved A) Develop surveys/ questionnaires (40%) B) Ensure the distribution of surveys/ questionnaires in collaboration with NGOs (20%) C) Data analysis and reporting (20%) D) Assess solution possibilities (20%)	**Responsible Agency/ Institution:** SHGM **Stakeholders:** NGO	Actions completion rate (%)	40	80	100	100	100
2.2.2. Target: Identify and produce solutions to the problems in coordination with patient organizations (NGOs)							
2.2.2.1. Organize routine meetings (four times per month) with patient associations and professional organizations	**Responsible Agency/ Institution:** SHGM **Stakeholders:** NGO Professional Associations	Number of annual meetings	48	48	48	48	48

2. Supporting Patients and Their Relatives and Increasing Patient Quality of Life							
2.2.3. Target: Strengthen the communications between patients, their relatives, and healthcare professionals, provide patients and their relatives access to support groups, and ensure that they are informed regarding protection, treatment options, and scientific research on diseases.							
Actions	**Responsible and Collaborating Agency/ Institution**	**Process Indicator**	**2023**	**2024**	**2025**	**2026**	**2027**
2.2.3.1. Organize meetings (bimonthly) with representatives of patient associations, professional organizations, and the Ministry of Health, focusing on a single disease group per meeting	**Responsible Agency/ Institution:** SHGM TİTCK **Stakeholders:** SSI NGO Professional Organizations	Number of annual meetings	6	6	6	6	6
2.2.4. Target: Develop informative and guiding documents and online information regarding public resources and social services that can be accessed by patients during the treatment process							
2.2.4.1. Increase knowledge of healthcare and social services among service providers A) Ensure that standard training activities are prepared by the Rare Diseases Education Commission and prepare a distance education program on rare diseases, the course of common rare diseases, their psychological effects, and public resources and social services that can be accessed by patients through distance education for healthcare institutions and relevant social services involved (40%) B) Deliver training to field personnel (40%) C) Increase the number of patients receiving support (20%)	**Responsible Agency/ Institution:** SHGM SGGM The Ministry of Family and Social Services	Action completion rate (%)	15	30	50	75	100

2. Supporting Patients and Their Relatives and Increasing Patient Quality of Life							
2.2.5. Target: Provide psychological support, social support, and counseling services and develop self-help groups to deal with negative feelings, such as stress, fear, guilt, and loneliness, and challenges, such as social isolation, of the diseases.							
Actions	**Responsible and Collaborating Agency/ Institution**	**Process Indicator**	**2023**	**2024**	**2025**	**2026**	**2027**
2.2.5.1. Ensure that patients benefit from mental health services A) Prepare training and group activities on topics such as mental health problems likely to be encountered by patients with rare diseases and their relatives, coping skills, and availability of mental health services (50%) B) Deliver training activities to families in collaboration with patient and professional organizations (50%)	**Responsible Agency/ Institution:** HSGM SHGM **Stakeholders:** NGO	Action completion rate (%)	10	30	50	75	100
2.2.6. Target: Develop remote psychological support, social support, and counseling services to help patients and their relatives cope with the psychological problems entailed by the disease							
2.2.6.1. Develop a remote healthcare service mobile application for psychosocial support purposes A) Build technical infrastructure (50%) B) Provide personnel employment and equipment (20%) C) Perform pilot applications (15%) D) Ensure broad implementation of the service (15%)	**Responsible Agency/ Institution:** SHGM **Stakeholders:** SBSGM	Action completion rate (%)	25	50	70	85	100

3. Diagnosis and Prevention of Rare Diseases							
3.1. Role of Healthcare Professionals in Primary Healthcare Institutions in Diagnosis							
3.1.2.1. Target: Ensure that physicians working in primary healthcare institutions have the required knowledge and skills to correctly refer the patient to the relevant specialist or healthcare institutions if deemed necessary							
Actions	**Responsible and Collaborating Agency/ Institution**	**Process Indicator**	**2023**	**2024**	**2025**	**2026**	**2027**
3.1.2.1.1. A) Establish an inventory of physicians handling rare diseases (25%) B) Build the infrastructure to direct patients to physicians specialized in their fields (25%) C) Integrate the infrastructure with Orphanet Türkiye (25%) D) Ensure that primary care practitioners have access to and use this information infrastructure (25%)	**Responsible Agency/ Institution:** TÜSEB **Stakeholders:** HSGM SHGM SBSGM	Action completion rate (%)	30	70	90	100	100
3.2. Expanded Newborn Screening							
3.2.2.1. Target: Expand and maintain screening programs							
3.2.2.1.1. A) Establish an executive committee comprising the heads of relevant departments from the General Directorate of Public Health, TÜSEB, General Directorate of Healthcare Services, and General Directorate of Public Hospitals (i.e., the relevant units of the Ministry of Health) for efforts toward expansion and maintenance of screening programs (30%)	**Responsible Agency/ Institution:** HSGM **Stakeholders:** TÜSEB SHGM KHGM	Action completion rate (%) Number of annual screening evaluation meetings	30	100 2 meetings	2 meetings	2 meetings	2 meetings

3. Diagnosis and Prevention of Rare Diseases							
3.2. Expanded Newborn Screening							
3.2.2.1. Target: Expand and maintain screening programs							
Actions	**Responsible and Collaborating Agency/ Institution**	**Process Indicator**	**2023**	**2024**	**2025**	**2026**	**2027**
B) Ensure that scientific evidence, plot studies, and economic outputs are evaluated by the "Rare Diseases Screening Scientific Committee" comprising subject matter experts assigned by the executive committee. Ensure that an evidence-based decision algorithm is developed to review available evidence on diseases that may be included in the newborn screening program in terms of disease, diagnostic testing, treatment options, efficiency, and acceptability of screening programs. Evaluate screening program benefits, cost efficiency, and identification of diseases (50%) C) Ensure that the relevant committee and scientific board evaluate the existing screening programs according to the established algorithm at regular intervals, such as biannual, and make recommendations on screening programs that may be implemented for diseases excluded from the program by reviewing the evidence (10%) D) Conduct pilot studies for planned tests when deemed necessary (10%)	**Responsible Agency/ Institution:** HSGM **Stakeholders:** TÜSEB SHGM KHGM	Action completion rate (%) Number of annual screening evaluation meetings	30	100 2 meetings	2 meetings	2 meetings	2 meetings

3. Diagnosis and Prevention of Rare Diseases							
3.2. Expanded Newborn Screening							
3.2.2.2. Target: Increase knowledge and skills among relevant specialist physicians and laboratory staff with interventional competencies under the Medical Specialization Training Core Curriculum to expand the newborn screening program							
Actions	**Responsible and Collaborating Agency/ Institution**	**Process Indicator**	**2023**	**2024**	**2025**	**2026**	**2027**
3.2.2.2.1. A) Develop standard training activities to harmonize activities among relevant specialist doctors and laboratory staff with interventional competencies under the Medical Specialization Training Core Curriculum and primarily responsible for the currently ongoing screening efforts (50%) B) Ensure that relevant specialists and laboratory staff benefit from training activities (50%)	**Responsible Agency/ Institution:** HSGM SHGM	Action completion rate (%)	50	60	70	85	100
3.2.2.3. Target: Improve the diagnosis, treatment, and follow-up processes of patients with suspicion in screening tests							
3.2.2.3.1. Increase the number of major and minor specialists and well-equipped assistant healthcare providers involved in the diagnosis, treatment, and follow-up and ensure broad implementation across Türkiye based on needs. A) Identify the current situation and create projections regarding relevant healthcare staff (25%) B) Create plans to ensure proper distribution (25%) C) Follow up on the increase in the number of healthcare staff and their distribution compared to the current projection (50%)	**Responsible Agency/ Institution:** YHGM SHGM	Action completion rate (%)	25	50	100	100	100

3. Diagnosis and Prevention of Rare Diseases							
3.2. Expanded Newborn Screening							
3.2.2.3. Target: Improve the diagnosis, treatment, and follow-up processes of patients with suspicion in screening tests							
Actions	**Responsible and Collaborating Agency/ Institution**	**Process Indicator**	**2023**	**2024**	**2025**	**2026**	**2027**
3.2.2.3.2. Build the necessary infrastructure to ensure access to relevant specialists through remote healthcare services in required areas to improve the quality and accessibility of follow-up and treatment services A) Ensure the follow-up of the post-screening processes by establishing responsible teams comprising relevant major specialists and coordinators from the organization of the Ministry of Health in individual provinces (25%) B) Design and establish a follow-up system for remote healthcare services for each disease and provide training activities for pediatricians, pediatric nurses, public health nurses, relevant major specialists, minor specialists, and coordinators included in the system (35%) C) Make the pilot application (15%) D) Ensure broad implementation across Türkiye (25%)	**Responsible Agency/ Institution:** HSGM SHGM SBSGM KHGM	Action completion rate (%)	15	25	60	75	100

3. Diagnosis and Prevention of Rare Diseases							
3.2. Expanded Newborn Screening							
3.2.2.4. Target: Minimize the maximum turnaround time between sampling for newborn screening and reporting to the families of babies with positive results							
Actions	**Responsible and Collaborating Agency/ Institution**	**Process Indicator**	**2023**	**2024**	**2025**	**2026**	**2027**
3.2.2.4.1. A) Determine the current time period (20%) B) Identify rate-limiting factors (20%) C) Determine the target period (20%) D) Take measures (20%) E) Report the result annually (20%)	**Responsible Agency/ Institution:** HSGM **Stakeholders:** SHGM	Action completion rate (%)	20	60	80	100	100
3.2.2.5. Target: Develop local diagnostic kits							
3.2.2.5.1. A) Determine the current situation and target kits B) Provide project support for the development of local diagnostic kit C) Provide advisory services in the transformation of projects into products D) Make the kits available for use	**Responsible Agency/ Institution:** TÜSEB **Stakeholders:** HSGM SHGM TÜBİTAK	1-Number of calls opened 2-Number of projects supported as a result of the call	1 per year 3 per call	1 per year 3 per call	1 per year 3 per call	1 per year 3 per call	1 per year 3 per call

3. Diagnosis and Prevention of Rare Diseases							
3.3. Carrier Screening							
3.3.2.1. Target: Determine the prevalence of the genes associated with rare genetic diseases observed through pilot studies							
Actions	**Responsible and Collaborating Agency/ Institution**	**Process Indicator**	**2023**	**2024**	**2025**	**2026**	**2027**
3.3.2.1.1. A) Ensure that the Rare Diseases Screening Scientific Committee identifies the diseases requiring prevalence studies and prepares the relevant study plan (40%) B) Provide a financial infrastructure (20%) C) Complete studies and share the results with relevant agencies and institutions (40%)	**Responsible Agency/ Institution:** HSGM **Stakeholders:** TÜSEB Universities Professional Organizations	Action completion rate (%)	20	40	60	80	100
3.3.2.2. Target: Ensure that the diseases deemed necessary by the Rare Diseases Screening Scientific Committee are included within the scope of the carrier screening program and screened with appropriate methods							
3.3.2.2.1. A) Ensure that the decision-making algorithm specific to carrier screening is developed by the Rare Diseases Screening Scientific Committee. This includes evaluation of the incidence of the genes associated with the disease, severity of the disease, scientific evidence, economic outputs, treatment options, and efficiency and acceptability of the planned screening program (50%) B) Share the decisions taken based on the established algorithm with the relevant agencies and institutions (50%)	**Responsible Agency/ Institution:** TÜSEB **Stakeholders:** HSGM Universities Professional Organizations	Action completion rate (%)	25	50	75	100	100

3. Diagnosis and Prevention of Rare Diseases							
3.3. Carrier Screening							
3.3.2.3. Target: Broadly implement and increase the quality of genetic counseling service when required, such as in risky marriages							
Actions	**Responsible and Collaborating Agency/ Institution**	**Process Indicator**	**2023**	**2024**	**2025**	**2026**	**2027**
3.3.2.3.1. A) Develop genetic counseling training programs (50%) B) Prepare genetic counseling standard guidelines (50%)	**Responsible Agency/ Institution:** SHGM **Stakeholders:** YÖK	Action completion rate (%)	25	50	75	100	100
3.3.2.4. Target: Improve the knowledge and skills of existing specialists to effectively provide pre-implantation genetic diagnosis (PGT) services							
3.3.2.4.1. A) Organize in-service training programs for medical genetics and pediatric genetics specialists in the public sector (50%) B) Ensure that there are medical and pediatric genetic disease specialists that can perform PGT in each upper healthcare service region and provide the necessary infrastructure opportunities for these specialists (50%)	**Responsible Agency/ Institution:** SHGM KHGM **Stakeholders:** Professional Organizations Universities	Action completion rate (%)	25	50	75	100	100

3. Diagnosis and Prevention of Rare Diseases							
3.4. Cascade Testing							
3.4.2.1. Target: Screen the relatives of the individuals found to have a hereditary disease that may potentially lead to disability and death, such as Long QT Syndrome, for the relevant genetic disease and take necessary preventive or therapeutic measures, such as medication and implantable defibrillators, for individuals found to have the associated genetic disease							
Actions	**Responsible and Collaborating Agency/ Institution**	**Process Indicator**	**2023**	**2024**	**2025**	**2026**	**2027**
3.4.2.1.1. A) Ensure that the diagnoses meeting the definition are identified by the Rare Diseases Screening Scientific Committee (20%) B) Identify the individuals with the specified diagnoses and their family members through family screening and plotting family trees (20%) C) Ensure qualified and continuous follow-up of these patients by sending notices to their primary care practitioners (20%) D) Provide genetic counseling services to patients by reaching the relevant individuals through the responsible primary care practitioner and direct them to the appropriate centers (20%) E) Prepare a report on the number of patients reached per year (20%)	**Responsible Agency/ Institution:** HSGM SHGM TÜSEB **Stakeholders:** Tertiary Healthcare Facilities	Action completion rate (%)	15	30	60	90	100

3. Diagnosis and Prevention of Rare Diseases							
3.5. Pre-Conception and Prenatal Care							
3.5.2.1. Target: Prevent exposure to harmful products and pathogens before and during pregnancy by explaining potential risks to mothers and take measures deemed necessary, such as pre-conception rubella vaccination, folic acid supplementation, and environmental arrangement							
Actions	**Responsible and Collaborating Agency/ Institution**	**Process Indicator**	**2023**	**2024**	**2025**	**2026**	**2027**
3.5.2.1.1. A) Identify fetal development risk factors to be targeted (30%) B) Prepare information resources related to target risk factors (30%) C) Report fetal development risk factors for rare diseases during pregnancy to all couples registered in primary care within the scope of premarital screening (40%)	**Responsible Agency/ Institution:** HSGM **Stakeholders:** SGGM Professional Organizations SBSGM	Action completion rate (%)	15	30	60	80	100
3.6. At-Risk Population Screening							
3.6.2.1. Target: Perform symptom-based screening of individuals with possible undiagnosed rare diseases							
3.6.2.1.1. A) Ensure that the Rare Diseases Screening Scientific Committee identifies the rare diseases that can be detected based on the symptoms and risk groups for these diseases as target groups (35%) B) Identify at-risk individuals (35%) C) Take protective measures, provide appropriate treatment, provide genetic counseling to the family when needed, and apply cascade testing (30%)	**Responsible Agency/ Institution:** SHGM HSGM KHGM TÜSEB **Stakeholders:** Professional Organizations Universities	Action completion rate (%)	15	35	50	70	100

4. Treatment and Care Services							
4.1. General Treatment and Care Services							
4.1.2.1. Target: Develop evidence-based well-defined care plans outlining the expected course of diseases and establishing the responsibilities of primary, secondary, and tertiary healthcare institutions and healthcare professionals providing care services in these institutions.							
Actions	**Responsible and Collaborating Agency/ Institution**	**Process Indicator**	**2023**	**2024**	**2025**	**2026**	**2027**
4.1.2.1.1. A) Establish disease-specific scientific boards for at least five rare diseases, to be determined based on their priority B) Ensure that standard treatment and care protocols are developed by the relevant scientific boards. C) Conduct field-oriented training activities for each protocol	**Responsible Agency/ Institution:** SHGM SGGM **Stakeholders:** Professional Organizations	Number of protocols issued	1	2	3	4	5

4. Treatment and Care Services							
4.1. General Treatment and Care Services							
4.1.2.2. Target: Provide remote healthcare and information technologies services to allow the physicians and healthcare providers in the relevant field of specialty to coordinate care							
Actions	**Responsible and Collaborating Agency/ Institution**	**Process Indicator**	**2023**	**2024**	**2025**	**2026**	**2027**
4.1.2.2.1. A) Create remote healthcare service infrastructure in secondary and tertiary pilot healthcare institutions (50%) B) Designate responsible physicians for each province from and among minor specialists working in the other regions of the country, who will be contacted when needed in regions with geographically limited access to minor specialists or insufficient number of specialists. Develop remote healthcare and consultation services. (30%) C) Ensure patient follow-up through coordination of provincial teams established under clause 3.2.2.3.2 and minor specialists responsible for the relevant province (10%) D) Broadly expand the practice to the field (10%)	**Responsible Agency/ Institution:** SBSGM KHGM HSGM SHGM Universities	Action completion rate (%)	25	50	80	90	100
4.1.2.3. Target: Establish specialized service units in accordance with the specified standards to produce rapid and specific medical services for individuals with rare diseases							
4.1.2.3.1. A) Increase the number of NMD service units to 20 (50%) B) Establish a specialized pilot service unit in each upper healthcare service region for at least two rare diseases to be identified, in addition to NMD service unit (50%)	**Responsible Agency/ Institution:** SHGM KHGM	Action completion rate (%)	25	50	75	90	100

4. Treatment and Care Services							
4.1. General Treatment and Care Services							
4.1.2.4. Target: Support existing centers guiding Türkiye's policies and scientific researches dealing with rare diseases in a multidisciplinary manner to turn into Centers of Excellence.							
Actions	**Responsible and Collaborating Agency/ Institution**	**Process Indicator**	**2023**	**2024**	**2025**	**2026**	**2027**
4.1.2.4.1. A) Inventory rare disease applications and research centers (35%) B) Remedy the deficiencies of the relevant centers based on the TÜSKA center of excellence infrastructure (35%) C) Ensure domestic and international coordination of candidate centers of excellence, including ERN memberships (30%)	**Responsible Agency/ Institution:** TÜSEB TUBİTAK **Stakeholders:** Universities Tertiary Healthcare Facilities	Action completion rate (%)	15	35	70	90	100
4.1.2.5. Target: Ensure that the centers of excellence established share knowledge, experience, and expertise with other hospitals, service units, centers, primary healthcare teams, social care and training teams, and home care services in the field							
4.1.2.5.1. A) Open centers of excellence (50%) B) Support and ensure the coordination of the training and services to be provided (50%)	**Responsible Agency/ Institution:** TÜSEB **Stakeholders:** Tertiary Healthcare Facilities	Action completion rate (%)	15	25	50	75	100

4. Treatment and Care Services							
4.2. Biological Drugs and Genetic and Cellular Therapies used in the Treatment of Rare Diseases							
4.2.2.1. Target: Develop national orphan drug legislation considering international legislation and support decisions based on legislation and scientific procedures and models to provide individuals with rare diseases access to treatment. Evaluate new treatments.							
Actions	**Responsible and Collaborating Agency/ Institution**	**Process Indicator**	**2023**	**2024**	**2025**	**2026**	**2027**
4.2.2.1.1. A) Establish a scientific board to evaluate the cause-based treatments of rare diseases (orphan drugs) (10%) B) Conduct scientific studies regarding orphan drug legislation and decision models (20%) C) Develop legislation, such as registration, pricing, and reimbursement, regarding orphan drugs containing guidelines to accelerate patients' access to treatment, including treatments not available in Türkiye. Identify priority categories and determine the intellectual property concept for orphan drugs to ensure high-priority and rapid evaluation in the registration processes (10%) D) Develop scientific procedures and decision models (20%)	**Responsible Agency/ Institution:** TITCK **Stakeholders:** SSI SHGM	Action completion rate (%)	25	75	100	100	100

4. Treatment and Care Services							
4.2. Biological Drugs and Genetic and Cellular Therapies used in the Treatment of Rare Diseases							
4.2.2.1. Target: Develop national orphan drug legislation by taking international legislation into account and support the decisions in the light of legislation and transparently with scientific procedures and models for providing individuals having rare diseases with access to treatment and evaluating the new treatments developed							
Actions	**Responsible and Collaborating Agency/ Institution**	**Process Indicator**	**2023**	**2024**	**2025**	**2026**	**2027**
4.2.2.1.1. E) Ensure that the newly developed treatments are evaluated by the relevant scientific board in accordance with the orphan drugs legislation, using previously established procedures and decision models and considering the level of scientific evidence, patient needs and disease burden, benefits and side effects, and the cost-efficiency of the treatment. Make approved treatments available for use (20%) F) Establish certified specialized centers, with high-tech products, such as gene therapy, approved by the scientific board administered to patients (20%)	**Responsible Agency/ Institution:** TITCK **Stakeholders:** SSI SHGM	Action completion rate (%)	25	75	100	100	100
4.2.2.2. Target: Achieve the European average in terms of availability of new treatment options in the field of rare diseases.							
4.2.2.2.1. A) Evaluate the current situation in Türkiye compared to other countries (20%) B) Identify barriers to access to treatment (40%) C) Make efforts to overcome the identified barriers (40%)	**Responsible Agency/ Institution:** TITCK	Action completion rate (%)	20	40	60	80	100

5. Research and Development Activities							
5.1. Increasing the Level of Evidence (National Rare Diseases Data System)							
5.1.2.1. Target: Collect incidence and prevalence data of rare diseases through epidemiological studies							
Actions	**Responsible and Collaborating Agency/ Institution**	**Process Indicator**	**2023**	**2024**	**2025**	**2026**	**2027**
5.1.2.1.1. A) Draw the distribution map of rare diseases in Türkiye considering studies specified in activities no. 3.3.2.1. and 1.2.3.1. (50%) B) Interpret the epidemiological, clinical, and economic data and share the results with the decision-making authorities and institutions on the relevant matters (50%)	**Responsible Agency/ Institution:** TÜSEB TÜBİTAK **Stakeholders:** HSGM SHGM	Action completion rate (%)	10	40	60	80	100

5. Research and Development Activities							
5.1. Increasing the Level of Evidence (National Rare Diseases Data System)							
5.1.2.2. Target: Establish a national rare diseases data system							
Actions	**Responsible and Collaborating Agency/ Institution**	**Process Indicator**	**2023**	**2024**	**2025**	**2026**	**2027**
5.1.2.2.1. A) Establish a data system (30%) B) Collect data meeting the principles of findability, accessibility, interoperability, and reusability (FAIR) using the data system to be established (20%) C) Ensure the financial and operational sustainability of the data system (20%) D) Integrate the established data system into existing patient registry systems (20%) E) Organize a workshop on data sharing with relevant authorities and institutions, Ministry of Health, professional organizations, and NGOs, including patient organizations and associations representing the industry (10%)	**Responsible Agency/ Institution:** SBSGM SHGM **Stakeholders:** Universities TÜSEB Professional Organizations	Action completion rate (%)	15	30	50	70	100
5.1.2.3. Target: Identify the scientists working in the field of rare diseases							
5.1.2.3.1. A) Create the inventory of scientists working in this field (50%) B) Publish the inventory and update it on an annual basis (50%)	**Responsible Agency/ Institution:** TÜSEB	Action completion rate (%)	25	50	100	100	100

5. Research and Development Activities							
5.2. Diagnosis and Treatment Efforts							
5.2.2.1. Target: Establish biobanks for sampling in rare diseases. Encourage the use of existing biobanks to this end and ensure sustainability							
Actions	**Responsible and Collaborating Agency/ Institution**	**Process Indicator**	**2023**	**2024**	**2025**	**2026**	**2027**
5.2.2.1.1. A) Inventory existing biobanks (30%) B) Develop collaboration protocols for biobanks that may be suitable for rare disease trials (70%)	**Responsible Agency/ Institution:** TÜSEB TÜBİTAK **Stakeholders:** Universities and other research centers	Action completion rate (%)	15	30	50	70	100
5.2.2.2. Target: Support preclinical trials							
5.2.2.2.1. A) Provide laboratories, necessary physical infrastructure facilities, and human resources for biological medicine and gene and cellular therapies (50%) B) Make suitable centers available for common use (20%) C) Open calls for projects specific to rare diseases (20%) D) Provide support for project writing and coordination, and ensure international competitiveness (10%)	**Responsible Agency/ Institution:** TÜSEB TÜBİTAK **Stakeholders:** Universities Professional Organizations	Action completion rate (%)	25	40	50	70	100

5. Research and Development Activities							
5.2. Diagnosis and Treatment Efforts							
5.2.2.3. Target: Develop diagnostic and screening tests							
Actions	**Responsible and Collaborating Agency/ Institution**	**Process Indicator**	**2023**	**2024**	**2025**	**2026**	**2027**
5.2.2.3.1. A) Organize a workshop with stakeholders to identify the existing human resources and infrastructure in Türkiye (15%) B) Encourage the local production of tests used for diagnosis and screening and open and support project calls (45%) C) Establish a consortium for transformation of the developed diagnostic tools into products through public-private collaboration (40%)	**Responsible Agency/ Institution:** TÜSEB TÜBİTAK **Stakeholders:** SHGM Private Institutions	Action completion rate (%)	10	15	50	60	100
5.2.2.4. Target: Support and establish infrastructure for trials, including Phase 1 studies							
5.2.2.4.1. A) Provide infrastructure and staff support for centers with Good Clinical Practice (GCP) certification and increase the competencies of personnel in these units for studies on rare diseases (50%) B) Announce trials to be conducted on the "Clinical Trials Portal" (25%) C) Inspect centers twice per year (25%)	**Responsible Agency/ Institution:** TÜSEB TÜBİTAK TİTCK **Stakeholders:** Professional Organizations NGO Universities	Action completion rate (%)	25	50	75	100	100

5. Research and Development Activities							
5.2. Diagnosis and Treatment Efforts							
5.2.2.5. Target: Develop biopsychosocial support projects for patients and their relatives							
Actions	**Responsible and Collaborating Agency/ Institution**	**Process Indicator**	**2023**	**2024**	**2025**	**2026**	**2027**
5.2.2.5.1. A) Organize meetings twice per year in collaboration with the Ministry of Family and Social Services and with the attendance of relevant stakeholders to support patient participation in projects to improve their quality of life and increase their engagement in social and economic life. Enable patients to benefit from social rights, such as education, transportation, and employment as granted to chronic patient (50%) B) Follow up on the reflection of the impact of meetings on patients' lives using surveys and questionnaires containing patient opinions (25%) C) Evaluate survey results by sharing them with relevant authorities/ institutions and NGOs (25%)	**Responsible Agency/ Institution:** The Ministry of Family and Social Services **Stakeholders:** SHGM Professional Organizations NGO Universities	Action completion rate (%)	25	50	75	100	100

5. Research and Development Activities							
5.2. Diagnosis and Treatment Efforts							
5.2.2.6. Target: Identify and support scientists conducting research and trials for local development of gene therapies, biological medicine, cellular therapies, and high-tech products in Türkiye. Produce facilities to undertake production, train new scientists in this field, or recruit scientists from abroad to Türkiye. Provide infrastructure facilities required for development of medicine							
Actions	**Responsible and Collaborating Agency/ Institution**	**Process Indicator**	**2023**	**2024**	**2025**	**2026**	**2027**
5.2.2.6.1. A) Establish a coordination board for gene therapies, biological medicine, cellular therapies, and high-tech product (10%) B) Prepare a country report on gene therapies, biological medicine, cellular therapies, and high-tech products (10%) C) Provide necessary infrastructure for the development of treatment methods and required medicine (20%) D) Provide project support for the development of innovative methods, such as gene therapies, biological medicine, cellular therapies, and high-tech products (20%) E) Evaluate the opportunities for collaboration with the pharmaceutical industry and support production-oriented activities of companies that can advance in this field (10%)	**Responsible Agency/ Institution:** TÜSEB TÜBİTAK TİTCK **Stakeholders:** SHGM	Action completion rate (%)	20	40	60	80	100

5. Research and Development Activities							
5.2. Diagnosis and Treatment Efforts							
5.2.2.6. Target: Identify and support scientists conducting research and trials for local development of gene therapies, biological medicine, cellular therapies, and high-tech products in Türkiye. Produce facilities to undertake production, train new scientists in this field, or recruit scientists from abroad to Türkiye. Provide infrastructure facilities required for development of medicine							
Actions	**Responsible and Collaborating Agency/ Institution**	**Process Indicator**	**2023**	**2024**	**2025**	**2026**	**2027**
5.2.2.6.1. F) Develop required treatment methods and medicine through collaboration with international centers (20%) G) Perform analyses on separate reimbursement models in case of local development of relevant treatments (10%)	**Responsible Agency/ Institution:** TÜSEB TÜBİTAK TİTCK **Stakeholders:** SHGM	Action completion rate (%)	20	40	60	80	100

REPUBLIC OF TÜRKİYE
MINISTRY OF HEALTH

RARE DISEASES

HEALTH STRATEGY DOCUMENT AND ACTION PLAN

2023-2027