

Brussels, 19 May 2026

COST 038/26

DECISION

Subject: Memorandum of Understanding for the implementation of the COST Action
“Multidisciplinary Adaptations of Gamlss NETwork” (MAGNET) CA25124

The COST Member Countries will find attached the Memorandum of Understanding for the COST Action Multidisciplinary Adaptations of Gamlss NETwork approved by the Committee of Senior Officials at its 227th meeting held in Brussels on 19 May 2026.

MEMORANDUM OF UNDERSTANDING

For the implementation of a COST Action designated as

COST Action CA25124
MULTIDISCIPLINARY ADAPTATIONS OF GAMLSS NETWORK (MAGNET)

The COST Members through the present Memorandum of Understanding (MoU) wish to undertake joint activities of mutual interest and declare their common intention to participate in the COST Action, referred to above and described in the Technical Annex of this MoU.

The Action will be carried out in accordance with the set of COST Implementation Rules approved by the Committee of Senior Officials (CSO), or any document amending or replacing them.

The main aim and objective of the Action is to advance routine applied use of flexible distributional regression, specifically GAMLSS, across Public and One Health, infectious-disease modelling and predictive risk modelling, where decisions depend on centiles, thresholds, uncertainty, extremes, zeros and interval forecasts, yet practice remains largely mean-focused.. This will be achieved through the specific objectives detailed in the Technical Annex.

The present MoU enters into force on the date of the approval of the COST Action by the CSO.

OVERVIEW

Summary

Epidemiological and statistical models shape action in Public and One Health across humans, animals and environments. MAGNET targets three synergistic domains, Public & One Health (POH), Infectious Disease Modelling (IDM), and Predictive Risk Modelling (PRM), and aligns with EU One Health and health-security priorities. The Action maps EU and international efforts to ensure complementarity rather than duplication.

Generalized Additive Models for Location, Scale and Shape (GAMLSS) move beyond commonly-used mean-only models by estimating the full distribution (not just the mean) and handling heterogeneity, skewness, kurtosis, non-linearity and variance-mean relationships. GAMLSS already underpins modern centile and growth monitoring, yet uptake stalls when methods feel like a black box.

As a COST Action, MAGNET builds a practical European network of methodologists, clinicians, agencies and small and medium-sized enterprises (SMEs). Using COST instruments, workshops, training schools and short exchanges, the Action will run monthly cross-group sessions that deliver open releases, guides and pilots, including a no-code path (designed for time-to-first-result ≤ 15 minutes).

The impact pathway is concrete, from pilots to agency-agreed thresholds and then tested workflows in host contexts, aligned with EU surveillance and One Health agendas. Adoption and policy-citation metrics will be published on the project hub. By Month 24 at least four reusable workflows will be released and by Month 48 at least two partners will run a workflow in routine practice. All assets, code, benchmarks, applications and curricula, remain open and supported through Society stewardship and open infrastructure beyond the Action for at least three years, securing continuity and broad uptake.

Areas of Expertise Relevant for the Action • Health Sciences: Public and environmental health • Health Sciences: Epidemiology • Mathematics: Statistics • Computer and Information Sciences: Machine learning algorithms • Veterinary science: Databases, data mining, data curation, computational modelling	Keywords • public health • surveillance • One Health • GAMLSS • distributional regression
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Specific Objectives

To achieve the main objective described in this MoU, the following specific objectives shall be accomplished:

Research Coordination

- [Stakeholders]: Support sustained stakeholder engagement and co-action between clinical, methodological and applied teams, with early involvement of international/regional policymaker(s).
- [Repository-supported exchange]: Support collaboration and exchange of best practices between institutions, experts and beneficiaries through shared knowledge-exchange infrastructure for GAMLSS practice.
- [No code workflows]: Increase practical uptake of GAMLSS by coordinating, aligning and disseminating user-friendly no-code workflows for centile curves and distributional-focused modelling.
- [Training Capacity]: Strengthen capacity to apply GAMLSS through shared learning pathways, with a practitioner track for YRIs and Inclusiveness Target Countries (ITCs).

- [Harmonized practice]: Harmonize implementation, interpretation and reporting of GAMLSS in POH, IDM and PRM through shared guidelines and application-focused methodological practices.
- [EU Synergies & Methods]: Collaborate with multiple relevant EU-funded initiatives in One Health surveillance, infectious disease or predictive modelling, and advance distributional regression to inform future statistical upgrades.
- [Domain Adaptations]: Co-design field-specific adaptations with specialists (ecology, environmental science, medicine), including heavy-tailed, exceedance probability and interval forecasting modelling.
- [Society]: Foster an interdisciplinary GAMLSS community dedicated to practical GAMLSS use across life sciences and the domain triad, supporting continuity beyond the Action timeline.

Capacity Building

- [YRI Skills]: Enhance the analytical capacities of YRIs and researchers under the One Health approach, with the objective of fostering joint research and innovation initiatives.
- [Training Capacity]: Build structured GAMLSS proficiency through coordinated training pathways and shared learning practices across the network.
- [Career Development]: Support and accelerate YRI career progression through mentoring, short-term scientific missions (STSMs) and collaborative development opportunities.
- [Collaboration & Experts]: Strengthen interactions between GAMLSS methodologists and applied researchers and involve external experts to broaden methodological and applied perspectives.
- [Policy Track]: Strengthen policy-facing capacity by improving dialogue between communities.
- [Inclusiveness]: Involve ITCs in leading roles and strengthen gender, geographic and experience balance across Working Groups (WGs), network participation and knowledge exchange.
- [Digital Tools & Visibility]: Increase practical adoption and research visibility of MAGNET outputs through shared digital practices, documented methodological workflows and research communication.
- [Community Sustainability]: Build a sustainable interdisciplinary GAMLSS community and a continuity plan beyond the Action lifetime.

TECHNICAL ANNEX

1. EXCELLENCE IN S&T AND NETWORKING

A. Main challenge

Across the **Public and One Health (POH)**, **Infectious Disease Modelling (IDM)** and **Predictive Risk Modelling (PRM)** triad, decisions hinge on **extremes and thresholds** (centiles, exceedances, interval predictions/forecasting), yet practice still defaults to **mean-only** models. Generalized Additive Models for Location, Scale and Shape (**GAMLSS**) enable distributional regression, the kind of probabilistic outputs agencies need. However, routine adoption is hampered by fragmented communication, a steep learning curve, and lack of accessible, production-grade guidance/tools.

How does the triad function? POH integrates human-animal-environment health, IDM supplies analytic engines for transmission, surveillance and interval predictions, PRM forecasts risk from environmental, behavioural and socioeconomic determinants. Together, IDM and PRM strengthen POH interventions by turning distribution-aware signals into operational decisions.

Why this is timely.

- i. Rapid growth in **life-science data** creates immediate opportunities for distributional models to inform health services.
- ii. Accelerating **cross-border disease movement** demands coordinated, One Health probabilistic early warnings.
- iii. Many **algorithms and tools** still return unrealistic averages, ignoring tails, zeros and over/under-dispersion that matter for policy thresholds.
- iv. Advances in **Machine Learning (ML)** can be integrated within GAMLSS to deliver scalable, interpretable, probabilistic workflows.

Europe has the methods; what is missing is **coordination** to make distributional regression usable at scale by domain practitioners. Until that **gap** is closed, detection of extreme risks will be dulled, and policy responses will be slower and less cost-effective across POH-IDM-PRM. MAGNET closes the gap via interpretable, no-code workflows, starter templates and worked examples, enabling domain teams to produce first results rapidly and consistently.

B. Objectives

MAGNET's (Multidisciplinary Adaptations of Gamlss NETwork) primary aim is to increase the interdisciplinary application of an advanced methodological framework, GAMLSS, including GAMLSS centile estimation in Europe and worldwide. To achieve this, the Action focuses on cultivating synergies between GAMLSS experts, Young Researchers and Innovators (YRIs), and relevant current or potential stakeholders who could gain from these methods.

Research Coordination Objectives (RCOs)

- **RCO1 [Stakeholders]:** Support sustained stakeholder engagement and co-action between clinical, methodological and applied teams, with early involvement of international/regional policymaker(s).
- **RCO2 [Repository-supported exchange]:** Support collaboration and exchange of best practices between institutions, experts and beneficiaries through shared knowledge-exchange infrastructure for GAMLSS practice.
- **RCO3 [No code workflows]:** Increase practical uptake of GAMLSS by coordinating, aligning and disseminating user-friendly no-code workflows for centile curves and distributional-focused modelling.
- **RCO4 [Training Capacity]:** Strengthen capacity to apply GAMLSS through shared learning pathways, with a practitioner track for YRIs and Inclusiveness Target Countries (ITCs).
- **RCO5 [Harmonized practice]:** Harmonize implementation, interpretation and reporting of GAMLSS in POH, IDM and PRM through shared guidelines and application-focused methodological practices.
- **RCO6 [EU Synergies & Methods]:** Collaborate with multiple relevant EU-funded initiatives in One Health surveillance, infectious disease or predictive modelling, and advance distributional regression to inform future statistical upgrades.
- **RCO7 [Domain Adaptations]:** Co-design field-specific adaptations with specialists (ecology, environmental science, medicine), including heavy-tailed, exceedance probability and interval

forecasting modelling.

- **RCO8 [Society]:** Foster an interdisciplinary GAMLSS community dedicated to practical GAMLSS use across life sciences and the domain triad, supporting continuity beyond the Action timeline.

Capacity-Building Objectives (CBOs)

- **CBO1 [YRI Skills]:** Enhance the analytical capacities of YRIs and researchers under the One Health approach, with the objective of fostering joint research and innovation initiatives.
- **CBO2 [Training Capacity]:** Build structured GAMLSS proficiency through coordinated training pathways and shared learning practices across the network.
- **CBO3 [Career Development]:** Support and accelerate YRI career progression through mentoring, short-term scientific missions (STSMs) and collaborative development opportunities.
- **CBO4 [Collaboration & Experts]:** Strengthen interactions between GAMLSS methodologists and applied researchers and involve external experts to broaden methodological and applied perspectives.
- **CBO5 [Policy Track]:** Strengthen policy-facing capacity by improving dialogue between communities.
- **CBO6 [Inclusiveness]:** Involve ITCs in leading roles and strengthen gender, geographic and experience balance across Working Groups (WGs), network participation and knowledge exchange.
- **CBO7 [Digital Tools & Visibility]:** Increase practical adoption and research visibility of MAGNET outputs through shared digital practices, documented methodological workflows and research communication.
- **CBO8 [Community Sustainability]:** Build a sustainable interdisciplinary GAMLSS community and a continuity plan beyond the Action lifetime.

All objectives are translated to concrete work items and mapped to their responsible WG, tasks, outputs and timeline with sustainability ensured via community stewardship of Action outputs and shared resources beyond the Action timeline.

C. State-of-the-art

Building on the main challenge, epidemiological/statistical regression models are instrumental in Public and One Health (POH): they support infectious-disease control, early detection of developmental issues via centiles, predictive diagnostic and prognostic modelling. They are widely applied across COST countries and Near Neighbouring Countries (NNCs), but most remain restricted to mean-based models.

Three domains are particularly relevant for MAGNET:

- Public and One Health - integrative approaches linking human, animal, and environmental health, resonating with EU initiatives such as the “One Health European Joint Programme (EJP)”¹.
- Infectious Disease Modelling - focusing on epidemic dynamics and surveillance, with clear synergies to the “European Joint Programme on Antimicrobial Resistance (JPIAMR)”² and the European Centre for Disease Prevention and Control (ECDC).
- Predictive Risk Modelling - incorporating environmental, lifestyle, and socioeconomic risk factors in regression models, aligning with projects such as “Predictive Modelling Tools to evaluate the Effects of Climate Change on food safety and spoilage”³.

Classical approaches, such as linear models (LM), generalized linear models (GLM), generalized additive models (GAM), and time-series forecasting, remain the backbone of applied statistical work in these domains^{4,5}. However, they share two major limitations: i) a **narrow focus on modelling the mean** (“*mean regression models*”) ⁶, and ii) **usual reliance on restrictive distributional assumptions** (e.g. exponential family for LM/GLM/GAM). These limitations usually remain in more advanced models [Table 1C], such as Bayesian hierarchical models, distributional machine learning (ML), quantile/expectile and copulas. This poses barriers in skills and tooling, precisely what MAGNET addresses with centile-native indicators, exceedance-aligned tools with native families for tails/zeros, interval forecasting and a no-code path.

The GAMLSS framework addresses these challenges by modelling multiple distributional parameters, including location, scale, skewness, and kurtosis⁷. This makes GAMLSS uniquely suited for **centile-based indicators**, and **forecasting intervals directly relevant for policy and monitoring**. With over 100 distributions available and high parameterisation flexibility, GAMLSS provides tools that surpass mean-only regression models. **Key advantages** include handling of (i) heterogeneity in variance, (ii) skewed distributions, (iii) heavy-tailed phenomena, (iv) over- or under-dispersion, (v) zero-inflated outcomes and (vi) complex variance - mean relationships. In addition, it provides tools for modelling non-linear complex relationships. These properties are crucial for the POH-IDM-PRM triad. However, the learning curve is steep, and adoption remains limited outside expert statistical groups.

Despite these barriers, GAMLSS has already demonstrated impact:

- In human health, it has improved child growth monitoring through centile estimation, advancing beyond the Lambda-Mu-Sigma (LMS) method⁷ and leading to World Health Organization (WHO) Child Growth Standards (used in >150 countries), the Global Lung Function Initiative's (GLI) centile charts and sporadically in non-human settings^{8,9}.
- In environmental applications, it is used for rainfall extremes (Southern Water's Resource Plans, Water Resources South-East) and ecological monitoring (Great Barrier Reef Authority)¹⁰. They have also been applied for modelling fire risks, flooding, to detect toxicity in lakes¹¹, arsenic content in soil¹², pollution in the ocean¹³ and in plants¹⁴.
- In infectious disease analysis with implications to public health¹⁵, whether for humans¹⁶ or animals¹⁷, or in relation to the environment¹⁸, demonstrating their relevance to the domain triad.

The above demonstrations show the GAMLSS power in capturing extremes and realistic distributions, though uptake has been largely confined to statisticians and has not spread to domain researchers.

Dimension	Existing SoTA	Gap	MAGNET novelty	WG
Target of inference	LM/GLM/GAM, ARIMA, mean-based ML	Mean-centric, limited tails modelling	Multi-parameter with covariates, centiles & exceedance	1/2/3
Data features	Bayesian hierarchical, quantile/expectile, some distributional ML	Few centile-native tools, weak for zero-inflation, heavy tails	Native families for over/under-dispersion, zero-inflation, heavy tails	1/2/3
IDM dynamics	GLM/GAM families for surveillance counts/rates, endemic/epidemic models ¹⁹	Tail-risk alerts absent, thresholds not tied to policy, weak for zero-inflation/heavy tails	Distributional intervals for forecast, policy-aligned exceedance alerts, upgrade from mean-based models	2
POH centiles	WHO/GLI centiles, One Health governance	Non-human & environmental centiles missing	Cross-species/environmental centiles, percentile triggers for services	1
Operational isation	Deep probabilistic methods/ Forecasting ²⁰	Powerful, hard to deploy, limited interpretability	High interpretability, no-code path (<15 minutes), copula integration	3

Table 1C. State of The Art (not extensive) capability snapshot relevant to MAGNET, with focus on GAMLSS.

Relative to Bayesian hierarchical, quantile/expectile and distributional ML, MAGNET prioritizes centile-native, exceedance-aligned decision tools¹² with interpretable parameters (beyond the mean) and broad family support (zero-inflation, heavy tails), wrapped in a no-code path for practitioners, though with some model complexity. This adoption barrier motivates MAGNET's emphasis on interpretable, no-code workflows and training (see Subsection 1.B and Section 3).

There are clear opportunities for further adoption. POH can benefit from non-human growth curves, health economics can exploit distributional models to link income with health outcomes (e.g. how does our income affect a country's general health?)²¹, and electronic health records could support GAMLSS-based diagnostics with societal impact²². Machine Learning typically optimizes the mean⁶, overlooking distributional richness that GAMLSS captures. Open-source implementations (R packages gamlss⁷, bamlss²³) exist, but remain challenging for non-specialists. The Action leverages existing infrastructures and outputs, e.g., ECDC surveillance methods, WHO/GLI centile standards, and the open R ecosystems (gamlss, bamlss), and focuses on coordination, standardization and uptake, rather than re-inventing methods already available.

Building on EU and international efforts (e.g., One Health EJP¹, JPIAMR², ECDC surveillance tooling, WHO/GLI centile work), MAGNET advances the field by: (i) applying **distribution-aware decisions** (centiles, interval forecasts) through reusable workflows that sit on top of existing modelling tools rather than replacing them, (ii) **extending centile methods** beyond human growth to non-human and environmental settings (POH), filling a documented gap that has only a few applications⁸⁻⁹, (iii) **turning IDM practice from mean-oriented** methods towards policy-aligned interval forecasting and

exceedance alerts (thresholds negotiated with agencies), (iv) **unifying scattered methods** (GAMLSS/BAMLSS²³, quantile/expectile, distributional ML) into an **interpretable**²⁴, no-code pathway for practitioners, greatly reducing the adoption barrier, and (v) assembling benchmark datasets and protocols so results are comparable across domains and updates (versioned, open), accelerating method selection and uptake. MAGNET centers on networking, coordination, uptake and capacity-building rather than primary research, new research is pursued by members' external programs. Europe is leading and has strong expertise in flexible regression, but fragmented uptake. MAGNET **closes this gap** by connecting methodological and applied communities, stimulating methodological innovation, and coordinating training, awareness, and adoption.

D. Rationale for choosing networking to address the main challenge

Despite Europe's capacity in distributional regression and GAMLSS, this strength is not translating into routine impact, due to advances being scattered across disciplines, venues, and jurisdictions. Research output remains dispersed across specialized methods conferences or niche health meetings (e.g. neonatal development), which limits cross-field exchange on methodological refinements, deployment strategies, and new applications. Sporadic workshops and short training events by expert groups have had limited reach beyond the statistical community. Across POH-IDM-PRM, distributional triggers (growth centiles, transmission exceedances, environmental risk, interval forecasts) are **inherently cross-border**, a pan-European network is needed to create common definitions, threshold catalogues, reporting formats, and tail/zero validation protocols with multiple agencies. Unlike earlier efforts confined to a single disease area/discipline (e.g., One Health EJP thematic WPs, JPIAMR modelling clusters, WHO/GLI working parties), MAGNET is intentionally cross-domain and explicitly distributional, aligning POH-IDM-PRM under shared validation, reporting and adoption rules.

MAGNET provides added value by establishing a pan-European network that integrates statisticians, epidemiologists, infectious disease modellers, and One Health researchers. This collaborative framework enables structured knowledge exchange and targeted training, ensuring GAMLSS evolves in direct response to pressing applied needs. By organising coordinated activities across domains, MAGNET can create a sustainable foundation for long-term use of GAMLSS in health, environment, and policy contexts. Concretely, MAGNET deploys contained no-code GAMLSS workflows that run locally under each partner's **Data Protection Impact Assessment (DPIA) / Data Use Agreement (DUA)**, returning standardised summary statistics (centiles, exceedance probabilities, tail-weighted scores) for pan-EU comparison. A minimal working prototype (no-code flow) already runs on the host-institution environment. WG3 implements this into a full app and publishes Key Performance Indicators (KPI) metrics. A shared **Threshold Catalogue (TC)** and a **Distributional Validation Profile (DCP)** standardize triggers across countries and agencies, map them to consistent statistical outputs, and test extreme and zero values, **enabling privacy-preserving, cross-jurisdiction calibration and reliable comparisons** that a single research project cannot achieve. Networking drives scientific progress via: (i) a living, cross-domain benchmark (agreed ranked probability, weighted interval and tail metric scores), (ii) quarterly co-creation sessions that translate agency questions into method updates, (iii) open methods notes capturing improvements, and (iv) multi-site pilots that test generalisability, tracked via KPIs (see Subsection 3.C, KPI Registry).

Another strategic element is the development of a European GAMLSS society and recurring exchange format dedicated to distributional regression and its applications. This ensures continuity of collaboration and training, particularly for Young Researchers and Innovators (YRIs), beyond the lifespan of the Action. The Society stewards the app, code, guides and benchmarks, and anchors interdisciplinary Training Schools and provides a platform for global participation. This complements, rather than duplicates, disease-specific or methods-only meetings by making distributional regression a shared language across POH, IDM and PRM.

MAGNET thus demonstrates that networking, not isolated research projects, is the most appropriate mechanism for addressing the current challenge: bridging fragmented expertise, supporting methodological clarity, and accelerating adoption in applied domains. MAGNET uses COST tools such as WG meetings, Training Schools, STSMs/Virtual Mobility Grants and stakeholder sessions, to co-produce harmonized guidance, benchmarks and adoption guides, with privacy-preserving, no-code workflows enabling multi-site comparability. Building on EU and global initiatives as data and policy anchors, MAGNET **standardises methods** and **demonstrates cross-country** reproducibility through shared workflows and benchmarks.

E. Critical mass of the network

Initial capability spans more than 15 distributional-regression methodologists, >20 domain Leads (POH-IDM-PRM), >8 software developer leads and >4 agency/standards liaisons across WGs 1 - 4, sufficient to deliver RCO2/3/5/6/7. Roles include package/tool maintainers, benchmark/data stewards, and pilot-site coordinators embedded in surveillance, clinical, veterinary and environmental contexts. A competence matrix maps each objective (RCO1 - RCO8), ensuring redundancy and coverage.

The proposers can be grouped into three complementary categories:

- G1: Methodologists with extensive expertise in GAMLSS and distributional regression, including statisticians and mathematicians.
- G2: Applied researchers already using GAMLSS in areas such as epidemiology, neonatology and health economics.
- G3: Domain specialists in POH, IDM, and PRM who are beginning to adopt GAMLSS (e.g. veterinarians, physicians, environmental scientists).

The **interaction between POH, IDM, and PRM groups** is a key strength. Applied and domain specialists provide expertise and feedback on usability and interpretation gaps in the framework, while methodologists translate them into tools and adaptations. This synergy ensures practical uptake and helps convert methods into no-code workflows and reusable components, while agency liaisons align outputs (centiles, exceedance probabilities, interval forecasts) with operational thresholds.

MAGNET will expand capacity via quarterly open onboarding calls and MoUs (Memoranda of Understanding) with agencies/SMEs specifying role/output/review points leading to **network growth and meaningful engagement**. MAGNET targets at least ≥5 new institutions per semester and ≥2 new agency/SME partners per year, tracked under KPI-STAKE (see Section 3.C). Contribution pathways (code, benchmarks, guides) are supported through shared repos, issue trackers, and session reviews to keep new members productive and accountable. Growth selection uses transparent criteria (data readiness, policy relevance, replicability) to ensure high-leverage participation of new partners.

The Action will extend beyond its proposers, drawing in additional participants and stakeholders. This expansion is designed to ensure disciplinary breadth, geographic diversity, gender equity and strong inter-generational exchange. The interdisciplinary character of MAGNET builds a durable critical mass and ensures continuity of expertise across Europe and partner countries through documented guides, shared benchmarks and succession plans within WGs.

2. IMPACT

A. Impact related to objectives

MAGNET links the objectives to concrete impact pathways across science, society and policy so that Europe translates methodological capacity into applied leadership and sustains global competitiveness. For instance, MAGNET aims to spread agency-aligned exceedance alerts to non-human and environmental contexts by operationalising co-design with agencies and targeted training/placements so “black-box” methods become transparent and provide tools for routine use. In addition, MAGNET creates structured collaboration channels between researchers and policy actors, ensuring practice informs methods and methods return as transparent policy-aligned tools. Unlike prior growth-centric fora (e.g., GLI/WHO streams), MAGNET institutionalises cross-domain benchmarks, release gates, and a policy-brief cadence mapped to Section 3.C deliverables.

Scientific & technological impacts ([Short] ≤12 months, [Medium] 1-3 years, [Long] ≥3 years)

1. Strengthen theoretical, methodological and applied framework for GAMLSS. [RCO6] [Medium]
2. Deliver reference case studies addressing priority issues across the triad. [RCO7] [Short]
3. Enhance visibility and findability of GAMLSS (hub, DOIs). [RCO2-RCO4] [Short]
4. Produce guidelines for sound application of GAMLSS in One Health settings. [RCO5] [Medium]
5. Improve usability via no-code workflows/packaging. [RCO3] [Medium]
6. Extend centile-native and exceedance applications to One Health and infectious-disease modelling and inform predictive models. [RCO5, RCO7] [Medium]
7. Promote adoption among epidemiology, infectious disease, and broader health research communities. [RCO4, RCO5, CBO2] [Medium]
8. Standardise knowledge on flexible distributional regression across Europe's institutions and

- stakeholders. [RCO5, RCO6] [Medium]
9. Establish a sustained, coordinated research agenda on GAMLSS with a user-friendly implementation framework and practitioner documentation. [RCO6, RCO7, RCO8] [Long]
 10. Embed GAMLSS into undergraduate and postgraduate programs. [CBO2, CBO4] [Long]
 11. Build an international, interdisciplinary community across life sciences and adjacent fields conducting research on/with GAMLSS. [RCO8, CBO8] [Long]
 12. Consolidate and expand Europe's leadership in flexible distributional regression. [RCO6, RCO7, CBO7] [Long]

Socio-economic and policy impacts ([Short] ≤12 months, [Medium] 1-3 years, [Long] ≥3 years)

1. Disseminate state-of-the-art One Health and medical insights to expert and non-expert audiences and relevant agencies via events and web resources. [RCO4, RCO5, CBO2] [Short]
2. Serve epidemiologists and biostatisticians on practical problems where GAMLSS is advantageous, informing strategic updates to modelling frameworks across the POH-IDM-PRM triad. [RCO5, RCO7] [Medium]
3. Accelerate applications with impact at patient and population level, improve extreme-event detection and robust inference under non-normal data. [RCO7, CBO2] [Medium]
4. Define cost-effective methodological frameworks (e.g., centile curves) suitable for both high- and low-income European settings, supporting efficient resource allocation in medical care, animal welfare and environmental management. [RCO5, RCO7] [Medium]
5. Advance research coordination and capacity building through specialised education, equal-opportunity access and improved career prospects for young scientists, contributing to territorial cohesion by widening participation. [CBO1-CBO8] [Long]

Three indicative pathways are provided, with agency involvement & KPI IDs (see Section 3.C):

- **Hospital-surge exceedance alerts** integrated into surveillance dashboards compatible with ECDC formats, **leading to** earlier escalation planning and allocation. [KPI-INTEGR2, KPI-POL2Y]
 - **Veterinary growth-centile alerts** integrated in national veterinary or World Organisation for Animal Health (WOAH) workflows, **leading to** earlier welfare checks and consistent reporting. [KPI-INTEGR2, KPI-EVAL-COMP]
 - **Air-pollution/heatwave exceedance alerts** integrated into joint public-health and environmental dashboards, **leading to** coordinated advisories (human/animal outdoor activity), vector-control readiness, and farm biosecurity actions. [KPI-INTEGR2, KPI-POL2Y, KPI-CONSULT].
- In short, the Action **aims** for i) **short-term benefits to surveillance teams**, ii) **medium-term to policy programmes** and iii) **long-term to curricula and clinical services**.

B. Involvement of stakeholders

MAGNET engages four primary categories of stakeholders:

1. **Researchers and scholars** (universities and institutes across COST, NNCs, International Partner Countries (IPCs)): GAMLSS/methods experts and domain scientists in POH-IDM-PRM.
2. **Policy bodies and agencies** at international (WHO, WOAH), European (ECDC, European Food Safety Authority (EFSA)) and national levels (ministries and competent authorities).
3. **Small and Medium-Sized Enterprises** (SMEs) in clinical research, epidemiology, software, and predictive modelling.
4. **Society and patient/animal welfare/public organisations**, including professional associations and civil/society groups.

The **Outreach (& Stakeholder) Lead** works with MC/Core Group (coordination) and WG connection officers to map stakeholders by topic, maintain contacts and MoUs, schedule consultations, and ensure timely responses. The Outreach Lead acknowledges external requests within 5 business days and schedules consultations within 30 days. Initial MoUs targeted: international bodies, 1 EU agency unit, SMEs and at least one national institute. WG4 (Networking & Knowledge Sharing) prioritises engagements quarterly via **an influence-interest matrix**. WG4 logs responses and runs a quarterly co-creation session co-chaired by an agency representative. In principle, where appropriate, stakeholders engage as peers rather than “end-users,” with shared authorship/credit, co-chairing opportunities, and clear routes to influence priorities and outputs. WG4 leads communications (web hub, news feed, mailing lists), prepares policy/lay briefs, and integrates feedback into releases, training, and guides. Engagement performance is mapped [Table 2B] and tracked (see Section 3.C).

Stakeholder	Roles in the Action	Engagement plan	Added value	Engagement barrier with response	Links (RCO/CBO)
Researchers & scholars	Co-create methods and workflows, contribute datasets/benchmarks, lead/teach in training, co-author guides (e.g., non-human/ neonatal growth, surveillance-methods groups)	Thematic WGs (POH-IDM-PRM), visiting exchanges (STSMs), curriculum co-design, open repositories and shared benchmarks	Scientific depth, high-quality validation, diffusion via academic networks	Limited time dealt with lightweight contribution paths & clear authorship	RCO2-RCO5, RCO7, RCO8, CBO2-CBO4
Policy bodies & agencies	Provide strategic advisory, align methods with policies, evaluate and adopt pilots (e.g., ECDC, EFSA, national public health institutes)	Advisory panels, targeted briefs, consultation Workshops, co-defined exceedance/centile thresholds	Policy relevance, access to surveillance systems, pathway to uptake	Agency onboarding delays mitigated via early MoUs	RCO1, RCO5, RCO6, RCO8, CBO7
SMEs	Implement pilot, make-a-product feedback, sustainability partnerships (e.g., clinical analytics vendor, epi-software provider, cloud hosting and operations partner)	Pilot calls, software, feedback sessions during Schools/ Workshops	Deployment expertise, route-to-market, tool robustness	Intellectual Property uncertainty dealt with permissive licences with template MoUs	RCO2, RCO3, RCO8, CBO5, CBO7
Society / patient & public organisations	Priority setting, plain-language review, dissemination to non-experts (e.g., patient advocacy group, animal-welfare organisations, environmental association)	Co-created surveys, public webinars, lay summaries and visuals per pilot	Relevance, trust, equity, broader uptake	Accessibility barriers with plain-language materials and outreach beyond usual venues	RCO5, CBO5, CBO7, CBO8

Table 2B. **Stakeholder engagement map**: roles, tailored plans, added value, and one key barrier-response per group, objective RCO/CBO links shown per stakeholder (KPIs in Section 3.C).

Stakeholder engagement sequence steps.

- Step 1. **Early identification & outreach**: leverage existing links and WG networks to invite stakeholders, MC validates invitations and participation.
- Step 2. **Open communication & visibility**: maintain a continuously updated public web hub with events, code, explainers, and benchmark summaries to widen involvement.
- Step 3. **Co-creation & feedback loops**: run dedicated sessions within Workshops and Training Schools, use surveys, protocol co-design, and structured feedback forms, maintain an open forum for comments on releases.
- Step 4. **Broadening participation**: recruit additional participants via targeted conferences and other knowledge-sharing means across statistics, epidemiology, One Health, and adjacent fields.

MAGNET explicitly **bridges research to policy** implementation, thus, i) agencies co-define thresholds and reporting formats, ii) researchers adapt methods to operational constraints, iii) SMEs test deployment and iv) patient/public groups review clarity/fairness. This bidirectional design accelerates method adoption while informing new methodological needs, tracked via KPIs (see Section 3.C).

MAGNET **consortium network baseline** currently includes 74 proposers (including 21 YRIs) from 40 countries (28 COST Members - 16 ITCs, 3 NNCs, 9 IPCs). The Action has pre-agreed participation with

2 national public health institutes across Europe, 1 agency-level unit, and 2 SMEs (clinical analytics, epi software, hosting). Roles span advisory panels, co-defined thresholds, pilot integrations, and evaluation. Non-binding expressions of interest are on file and will be formalised within 60 days of Action start via D2 (W4.MOU) deliverable templates (KPI-STAKE, see Section 3.C). MAGNET targets ≥ 2 agency and/or ≥ 2 SME MoUs signed by Month 12 (M12). Further growth uses open calls and MoUs with quarterly public coverage on the hub, progress is monitored. To widen participation, $\geq 30\%$ of training bursaries are dedicated for ITCs participants M1-M35, then $\geq 60\%$ from M36. To promote gender balance, the Action events target 45-55% gender balance in speakers/chairs, and publish bursary allocation stats each quarter on the web hub (GBIY - KPI pack, see Section 3.C).

Governance, ethics, and data protection. Collaborations are formalised with MoUs clarifying roles, contributions, and expected outputs. Data sharing follows DPIA/DUA procedures, where needed, synthetic or public data are used first. Intellectual Property (IP) and licensing adopt open, permissive defaults to enable reuse, with conflict-of-interest management for pilots. To tie governance to growth, the Outreach Lead applies the MoU templates to onboard ≥ 5 new institutions per semester and ≥ 2 agency/SME partners per year, with quarterly hub reporting.

C. Communication, dissemination and valorisation

The Action will draw on the consortium's diversity to generate **repositories of applied questions and solutions**, distilled into **open-access guides** and at least one applied guide for the POH-IDM-PRM triad. STSMs will support novel applications of the existing GAMLSS framework and accelerate the drafting of these materials through focused visits between institutions. All major knowledge assets (guides, casebooks, methods notes) will have DOIs and versioned releases, first public package by M12, updates follow on a quarterly basis thereafter (see Subsection 3.C, KPI registry).

Transfer of knowledge: interdisciplinary Workshops and Training Schools across experience levels will run alongside the inaugural GAMLSS Society Conference and may subsequently take place either as stand-alone MAGNET events or as sessions within relevant host conferences. Knowledge exchange will span career stages (with emphasis on YRIs and PhDs) and extend via participation in external society meetings. A public hub will host materials, while peer-reviewed publications support scholarly dissemination. SME co-creation sessions will be embedded in events to align the app, code + containers, templates, and release pipelines, with deployment needs. Outputs will be "open by default" (guides, code, workflows), with all embargoes documented. Training delivery is hybrid (onsite + synchronous online) with archived recordings and exercises, uptake and persistence are tracked via KPI-CMP (completion) and KPI-RET (retention) and micro-credential badges are issued for trainees who pass post-tests. Multilingual abstracts (EN + ≥ 2 EU languages) and accessibility features (captions, alt-text, accessible PDFs) are standard by the end of year 1 (KPI-WEB). For clinical audiences, the Action adds targeted modules and case-based sessions, with YRIs embedded as co-instructors/mentees, each multi-day event includes a policy/SME session and a public mini-lecture, with summaries posted within 10 business days (KPI-HUB-UP).

Career development: all activities will help participants build cross-disciplinary networks that lead to new research collaborations and initiatives. Particular attention will be given to engaging researchers from ITCs and to supporting YRIs through mentoring, placements, and opportunities to teach or co-author. Progress (e.g., co-authorships, placements, leadership roles) will be monitored and reported to support equitable advancement. Wider adoption will be encouraged via targeted outreach to methodologists, health researchers, and stakeholders who are new to GAMLSS. Career outcomes are monitored via KPI-CAREER20 (co-authored outputs) and KPI-PLAC10 (short placements), quarterly snapshots are posted on the web-page/hub.

Communications operations: WG4 maintains a rolling communications calendar, the public web page/hub (v1) goes live by M3 and hosts policy briefs starting M12. Community comments are triaged monthly and integrated into quarterly releases. Reach and uptake such as hub uptime, content analytics and downstream policy signals are tracked via KPIs (See Subsection 3.C, KPI registry).

Dissemination, exploitation, and public/policy dialogue: The primary channels are the web page/hub and associated social/scientific media, where training materials and resources remain freely available and maintained beyond the Action in partnership with the lead host institution. Policy routing will include versioned briefs coordinated with relevant European and

international channels (e.g., ECDC, EFSA, WHO) and national counterparts. Audiences are segmented (researchers, surveillance units, policy leads, SMEs, civil society) with tailored formats: i) methods notes and code for researchers, ii) checklists and Standard Operating Procedures (SOP)-style briefs for agencies, iii) how-tos for SMEs and iv) plain-language explainers for public groups (KPI-POL2Y, KPI-STAKE).

Scholarly dissemination: Scientific outcomes will be published in recognised peer-reviewed journals (with a strong preference for Open Access (OA)) and presented at conferences. Press releases and page/hub updates will amplify visibility. Further utilisation will be enabled through permissive licensing, template MoUs, and documented APIs for agencies/SMEs. OA preprints are encouraged and software under MIT/Apache-2.0 with examples and stable DOIs.

Civil society engagement: Patient, animal, and environmental associations will be invited to provide input on how-to but also to disseminate results in lay language on their websites and magazines. Public and policy dialogue will follow a communications calendar with transparent reporting. All lay pieces will include “why it matters” boxes, while feedback forms capture usefulness (KPI-CONSULT).

Valorisation and IPR (Intellectual Property Rights): Results intended for broad reuse (guides, software, benchmarks) will be released under open licences with clear attribution, where appropriate, dual-licensing and contributor agreements will protect community governance while enabling commercial uptake. Data sharing will comply with DPIA/DUA processes and may use privacy-preserving alternatives (e.g., synthetic data). Trademarks and brand assets for the Society and flagship tools will be managed to ensure quality, continuity, and recognisability. Where code contributions are expected at scale, a lightweight **Contributor Licence Agreement (CLA)** or **Developer Certificate of Origin (DCO)** will be used. Governance and compliance updates are reported in the annual KPI summary (KPI-GOVPACK, KPI-REPORT-OT).

By Month 12 (M12), the web/public hub is live with versioned/tracked assets, from M12-M48, ≥ 2 methods notes/year are delivered along with ≥ 1 practitioner guide/year, an applied book and hybrid Schools/Workshops with archived materials are delivered, plus policy/lay briefs via EU/national channels, all tracked (see Subsection 3.C, KPI registry).

3. IMPLEMENTATION

A. Action Structure

This section defines governance, horizontal roles and WG mandates/interfaces that put in operation the Objectives (RCO/CBO). The interrelation WG flow is, i) WG1/2 provide needs and data, ii) WG3 builds tools iii) WG4 drives training and stakeholder testing iv) MC/Core Group oversee progress and v) standards/benchmarks (WGs1-3 + MC/Core Group) feed quarterly release updates. [RCO1, RCO4/5, CBO2, CBO5].

Governance and Horizontal Roles (GHR)

- **Action Chair & Vice-Chair:** provide overall scientific/strategic leadership, ensure alignment with objectives, arbitrate cross-WG priorities, contribute to the Work and Budget Plan. [All RCO*/CBO*]
 - **Management Committee (MC):** oversees progress, inclusiveness, and ethics, approves invitations/engagements and verifies KPI/Milestone closure evidence. [RCO1, CBO3/6, CBO*]
 - **Working Group Leaders** (one per WG): serve as single points for dependencies, responsibility matrix and dependency log, monthly notes to MC, operating in line with the governance pack. WG Vice-Leaders may be appointed by the MC to support WG coordination. [RCO1]
1. **Science Communication Coordinator (SCC):** website, media/calendar, newsletters, briefs and visuals (with WG4). [RCO1, CBO5]
 2. **Grant Awarding Coordinator:** runs STSMs, conference grants, and training bursaries (fairness, inclusiveness) with published eligibility & scoring rubrics. [CBO1, CBO3]
 3. **Training Lead*:** maintains curricula coherence across Schools/Workshops, mentoring framework for YRIs/ITCs and learning outcome mapped with KPIs. [RCO4, CBO2]
 4. **Technical (Tech) Lead** (software)*: manages repositories, quality assurance, packaging, and no-code workflows (with WG3) and release governance (semantic versioning, DOI). [RCO2, RCO3]
 5. **Outreach (& Stakeholder) Lead*:** Anchors policy/SME/civil-society interfaces, MoUs [RCO1, CB04]

*Roles 3 - 5 are optional horizontal roles to be activated if needed. Additional support functions for ethics/data protection, society/events preparation and standards/benchmarks will be handled by the relevant Working Group Leaders under MC/Core group oversight. They may be formalized as temporary task teams only if required during later Grant Periods. MC may also maintain a public traffic-light dashboard (green/amber/red) for milestones, published by WG4 where appropriate.

Working Group 1: (WG1) Public and One Health (POH)

Mandate: apply domain applications in POH (e.g., health economics, veterinary, environmental epidemiology), identify gaps, co-develop domain guides. **Interfaces:** feeds real-world needs to WG3 (tooling) and MC/Core Group (coordination), co-develops centile/exceedance use-cases with WG3, co-authors guidance with WG4 and nominates agency co-chairs for sessions. [RCO5-7, CBO2, CBO4]

Working Group 2 (WG2): Infectious disease modelling (IDM)

Mandate: apply distributional regression for epidemic dynamics/nowcasting, policy-agreed thresholds, exceedance alerts and forecast intervals. **Interfaces:** shares designs with WG1 (One Health linkages), specifies operational requirements for WG3 tools, coordinates policy-facing outputs with WG4 incl. threshold validation protocols. [RCO6, RCO7, CBO2, CBO4]

Working Group 3 (WG3): Predictive Risk Modelling PRM & Software

Mandate: translate methods into usable software, no-code workflows, and scalable pipelines, support benchmarking, reproducibility and interpretability. **Interfaces:** ingests requirements from WG1/WG2, delivers tooling to WG1-2 and training material/support to WG4, works with Technical Lead on repositories/QA. [RCO2, RCO3, RCO6, CBO7]

Working Group 4 (WG4): Networking and knowledge sharing

Mandate: promote stakeholders & policy engagement, communications, web hub, open assets, and society build-out. **Interfaces:** co-owns dissemination with SCC, partners with MC/Core Group on governance, embeds co-creation sessions with WG1-WG3 and maintains the stakeholder registry and MoU log. [RCO1, RCO5, RCO8, CBO2, CBO5, CBO8]

B. Work plan (tasks, activities and time-frame)

This work plan sets out tasks, activities, milestones and time-frame to deliver the Objectives (RCO/CBO), using the legend T=Task, A=Activity, Dep=Dependency, D=Deliverable, M=Month, for traceability, activity lines show only Feeds: D, with full Objective/KPI mapping in Section 3.C.

Cross-WG coordination throughout the Action is carried out jointly by the MC/Core Group, Action Chair/Vice-Chair, WG Leaders, and horizontal roles. This includes: i) regular WG-Leads syncs, rolling action tracking, monthly MC reviews and coordination of decisions and scope changes, ii) KPI registry maintenance, quarterly dashboard updates, annual KPI reporting, risk follow-up, and ethics/data governance processes, iii) MC approval of stakeholder invitations and MoUs, together with oversight of Society preparation. Outputs feed into D1 Governance, Ethics and Risk Pack, D2 Stakeholder Role Matrix and MoU Templates, D5 Annual KPI Summary, and D18 Society Charter.

Working Group 1: Public and One Health (POH) - (RCO5-7, CBO2/CBO4)

- T1.1 SoTA & gap analysis (**M1-M6**) - Dep: None
 - A1.1 **Literature sessions** + expert survey, dataset inventory (growth, environment, health economics). Owner: WG1 Lead. Output: SoTA memo. Feeds: D7 (W123.L2_GUIDES).
- T1.2 Domain white paper(s) on centiles/exceedances (**M6-M12**) - Dep:T1.1
 - A1.2 **Define POH use-cases** with agencies, draft preprint. Owner: WG1. Output: White paper. Feeds: D11 (W123.L6_METHODS_NOTES).
- T1.3 Practitioner guide & learning resources (**M10-M18**) - Dep: T1.1,T1.2
 - A1.3 Worked **examples**, checklists, pitfalls, review with WG4. Feeds: D7 (W123.L2_GUIDES)..

Working Group 2: Infectious disease modelling (IDM) - (RCO6/RCO7, CBO2/CBO4)

- T2.1 IDM scan (Distributional GLM/GAM families for counts and rates) (**M1-M6**) - Dep: None
 - A2.1 Compare **GLM/GAM/Bayesian/Hierarchical models**, compile case notes. Owner: WG2 Lead. Output: SoTA memo. Feeds: D7 (W123.L2_GUIDES).
- T2.2 Methods notes (sparse/multilevel, policy thresholds, forecast interval) (**M6-M14**) - Dep: T2.1
 - A2.2 **Simulations + threshold map** with agencies. Feeds: D11 (W123.L6_METHODS_NOTES).
- T2.3 IDM guide & teaching set (**M10-M18**) - Dep: T2.1,T2.2
 - A2.3 **Labs/notebooks**, webinar pack. Feeds: D7 (W123.L2_GUIDES) (IDM v2).

Working Group 3: Predictive Risk Modelling PRM & Software - (RCO2/RCO3, CBO7)

- T3.1 Methods evaluation & enhancement (**M7-M12**) - Dep: T1.1,T2.1
 - A3.1 **Benchmarks for distributional targets/extremes**, machine learning, implement missing families/links if needed. Owner: WG3 Tech Lead. Feeds: D8 (W123.L3_CODE (v1)).
- T3.2 Predictive guidance (**M10-M18**) - Dep: T3.1
 - A3.2 **Validation protocols** (tail-scores) and **interpretability**. Feeds: D7 (W123.L2_GUIDES).
- T3.3 Tooling & no-code workflows (**M12-M38**) - Dep:T3.1
 - A3.3 **Repos/QA, packaging, starter notebooks**, no-code paths. WG3 promotes prototype to an alpha by M38 Feeds: D13 (W3.2_APP), D8 (W123.L3_CODE).

Working Group 4: Networking and knowledge sharing - (RCO1/RCO5/RCO8, CBO2/CBO5/CBO8)

- T4.1 Communications & briefs (**M1-M48**) - Dep: None
 - A4.1 Web hub + editorial calendar, lay/policy briefs, social channels (X/LinkedIn/Mastodon) and research platforms (Zenodo with DOIs, GitHub, YouTube). Owner: SCC. Feeds: D12 (W4.1_WEB_HUB), D15 (W4.L2_POLICY_PACK), D14 (W4.L1_GUIDE_PACK).
- T4.2 Networking instruments (**M1-M48**) - Dep: None
 - A4.2 Mailing lists, forums, MoUs, stakeholder registry. Owner: WG4 Lead. Output: Live comms stack supporting events. Feeds: D2 (W4.MOU), D12 (W4.1_WEB_HUB), D9 (W123.L4_STSM)
- T4.3 Training comms & archives (**M3-M48**) - Dep: CX3.
 - A4.3 Event pages, registrations, video archives, materials curation, recordings on YouTube and material mirrors on Zenodo/GitHub. Feeds: D6 (W123.TPACK), D12 (W4.1_WEB_HUB).
- T4.4 Stakeholder landscape & invitations (**M1-M4, refresh M12/M24/M36**) - Dep: None
 - A4.4 **Build/maintain stakeholder registry** (policy/SME/civil society). Owner: Outreach Lead Output: Contact matrix to WG4. Feeds: D12 (W4.1_WEB_HUB), D2 (W4.MOU).
 - A4.5 **Invites/MoUs for MC approval**. Owner: MC/Core Group + WG4. Output: MoUs. Feeds: D2 (W4.MOU)
- T4.5 Foundations for the international GAMLSS Society (**M24-M36**) - Dep: None.
 - A4.6 **Draft statutes & form Steering Group**, legal pathway assessed. Owner: Society/Conference Chair. Output: Statutes package. Feeds: D17 (W4.5_SOC_CHARTER (prep)).

Cross - WG joint activities (explicit activities)

- CX1 Co-creation sessions (SMEs/agencies + WG1-WG3) (Quarterly **from M6**) - Dep:T1.1,T2.1
 - A-CX1 2-hour sessions, decisions & issues logged, follow-up pull requests into code/guides. Feeds: D7 (W123.L2_GUIDES), D8 (W123.L3_CODE (v1)) & guide updates
- CX2 Shared benchmarks & open examples (**M6-M32**) - Dep:T1.1,T2.1
 - A-CX2 Curate datasets (MAGNET has available cross-sectional/time-series case study data on animal/environment/infections), baseline scripts, scoring, maintain leaderboards. Output: Benchmarks + notes Feeds: D8 (W123.L3_CODE (v1)), D11 (W123.L6_METHODS_NOTES).
- CX3 Training Schools & Workshops (dual tracks) (**M6,12,18,24,32,40,48**) - Dep: WGs1-3 content
 - A-CX3 Methods + practice streams, assessment & certificates, post materials. Feeds: W123.TPACK assets posted.
- CX4 Society launch & conference organisation (**M24-M41**) - Dep:T4.5
 - A-CX4 Call for Proposals, programme committee, logistics. Feeds: D17 (W4.5_SOC_CHARTER), D18 (W4.6_PROCEEDINGS).
- CX5 Open-science operations (**M1-M48**) - Dep:T3.3
 - A-CX5 Repo governance, contributor guide, DOIs, code of conduct. Feeds: D16 (W3.4_REPO).

Milestones: **M1** Kick-off & governance pack • **M3** Stakeholder map v1, communication & visibility live • **M6** SoTA v1 (POH/IDM), first session/benchmarks, first School • **M12** White papers (POH-IDM) draft, code v1 • **M18** Domain guides v1 (POH-IDM-PRM), methods notes bundle • **M24** ≥4 reusable workflows published (DOIs, versioned, hub pages live) • **M31/32** Unified repository, methods notes update • **M36-M37** Pilots mature, app feature-complete • **M38** No-code alpha, society prep • **M41** Society charter • **M48** First society conference, wrap-up releases.

Quick Map (M:D): **M6**:D7 (W123.L2_GUIDES) v1, **M12**:D8 (W123.L3_CODE) v1, **M18**:D7 (W123.L2_GUIDES) v2, **M32**:D16 (W3.4_REPO) (v1), **M38**:D13 (W3.2_APP (alpha)), **M41**:D17 (W4.5_SOC_CHARTER), **M48**:D18 (W4.6_PROCEEDINGS).

Table 3B. Risk register and contingencies. Risks, likelihood, condensed contingency, trigger thresholds, and follow-up actions, aligned to WG ownership and Subsection 3.A governance. Triggers/responses mirror Subsection 3.B timelines (e.g. “ within 10 days”) to keep oversight and escalation traceable to milestones

Risk Identification		Contingency plan (condensed)	Trigger	Follow-up
Inability of core members to fulfil commitments and lack of coordination.	Unlikely	Appoint 2 coordinators/leads per task, horizontal WG roles, reassign roles within WGs, redistribute workload, regular reviewing.	Owner unavailable for >2 weeks or task slip >2 weeks.	WG lead or MC-Core assigns deputy within 10 days, escalate to MC at next review.
Inadequate representation from stakeholders/ policy makers	Unlikely	Interaction of Outreach Lead with WG4 and MC/Core Group, if not appropriate Outreach is replaced, targeted outreach using a pre-agreed agency/SME backup list with diverse geography/ITC coverage.	<2 policy bodies/SMEs confirmed by M3 or 1 agency co-chair by M4.	WG4, Outreach Lead activates backups, escalates to MC at M3.
Too few enrolled in the Training Schools and/or Workshops and the final GAMLSS conference	Unlikely	Early calls for Training Schools and Workshops (>3-6 months) ahead, non-sufficient participation → enhancement of the publicity and dissemination strategy (WG4), combining under-subscribed cohorts, offer shorter online modules, provide support.	<60 registrations 6 weeks prior or prior completion <80%.	WG4, Training lead runs push, go/no-go at 4 weeks, target ≥80% completion and ≥30% ITCs participation.
Failure of adequate regularly MC / WG meeting attendance	Unlikely	Grant Holder Manager and MC/Core Group will take the initiative to forward agenda-based web-meetings. Shift to online teleconferences and meetings, circulate agenda & actions, 1:1 catch-ups for specific input.	<70% attendance in a month or ≥2 cancellations.	MC set online full agenda meeting, MC if repeated for 2 consecutive months.
Failure to initiate the international GAMLSS society and the biennial conference	Unlikely	Support from 15 GAMLSS and 30 distributional regression experts. Re-scope towards a community-of-practice, co-locate with existing conference, phased launch under the distributional regression umbrella.	<10 supporters (via written agreements) to launch the GAMLSS Society (M24).	WG4/Society lead suggests re-scope, MC decision at M24 and update launch timeline.
Non-availability of core members for Workshops/ Training Schools	Somewhat likely	Identify core members substitutes, activate a trainer pool, swap speaker, record sessions, reuse prior materials. Maintain a backup of 2 alternates per topic.	Lead/trainer unavailable >2 weeks or not confirmed 6 weeks out.	WG4 assigns backup, decision at 4 weeks before the event date.
WG1-WG2 interaction (challenges data sharing) in	Unlikely	Use SOPs and a DPIA, start with synthetic/public data and enforce controlled access. Partners expertise in data anonymization / encryption, No primary clinical data collected.	DPIA/DUA not approved by M3 or transfer slip >2 weeks.	if unapproved switch to synthetic at M4, MC escalates M3.

WG3 integration and algorithm implementation	ML and	Somewhat likely	Time-box to build features, create a Minimum Viable Product, postpone advanced ML to later minor releases, invite external trainers.	Milestone slip >4 weeks or critical bug >10 days.	WG3, Tech lead checks MVP, release go/no-go 72 hours prior.
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Risk tracking note: The tabulated risks (Table 3B) and the 5+ less likely risks; 1) cross-WG training coordination, 2) emerging risks, 3) travel/visa disruptions, 4) inclusiveness targets and 5) ethical and administrative delays, are continuously tracked in D1 (MC.L_GOV_PACK) and reviewed via monthly MC / quarterly dashboards, signals surfaced through KPI-CMP/KPI-RET, KPI-GOVPACK/KPI-REPORT-OT, KPI-CBO11 and GBIY (KPI-pack).

C. Deliverables

ID	Deliverable (Code & title)	Type	Owner WG	Time frame	Primary Objectives	Primary KPI
D1	MC.L_GOV_PACK, MC_ETHICS - Governance & Ethics, risk docs, Working Group Leader coordination templates (rolling)	Docs & toolkit	MC/Core Group (+ Governance)	Prepare from M1, then M6-M48	RCO1	KPI-GOVPACK
D2	W4.0_MOU - Stakeholder role matrix & MoU templates	Template	WG4 (+ MC/Core+Outreach)	M3-M48	RCO1, CBO5	KPI-STAKE
D3	W123.STANDARDS - Benchmark & reporting standards	Standard	WGs1-3 (+MC/Core Group)	M16	RCO6, CBO6	KPI-STDS-ADOPT
D4	W123.TC_DCP - Threshold Catalogue & Distributional Validation Profiles (living standard)	Standard set	WG1-3, (+MC/Core, agencies)	M18/30/42	RCO6, CBO6	KPI-STDS-ADOPT
D5	MC_KPI_REPORT - Annual KPI summary (public)	Report	MC/Core Group + WG4	M12/24/36/48	RCO1, CBO6	KPI-REPORT-OT
D6	W123.TPACK - Training curricula & materials releases (POH-IDM-PRM)	Course packs	WGs1-3 (+WG4) (+Training Lead)	M6(v0)/12(v1)/18/24/32/40/48	RCO4, CBO2	KPI-CMP
D7	W123.L2_GUIDES - Domain guides (POH-IDM-PRM, OA+DOI)	Guides	WGs1-3	M6(v0)/18(v1)/34	RCO5, CBO2	KPI-GUIDE-USE
D8	W123.L3_CODE - Unified code releases (repos + containers + examples)	Code & artefacts	WG3 (+WGs1-2 + Technical Lead)	M12/30/38	RCO3, CBO2	KPI-DL
D9	W123.L4_STSM - STSM reports & case-study compendium	Report set	MC (+WG4) (+Grant Lead)	M12/17/28/36/42	RCO4, CBO3	KPI-PLAC10
D10	W123.L5_PILOTS - Pilot dossiers (POH-IDM-PRM)	Reports + code + evaluation	WGs1-3 (+WG4)	M36-42	RCO7, CBO2	KPI-INTEGR2, KPI-EVAL-COMP
D11	W123.L6_METHODS_NOTES - Methods (ML, tails, zeros, exceedance, forecast intervals)	OA methods notes	WG3 (+WG1-2)	M12(v0)/18(v1)/M32	RCO6, CBO6	KPI-METH-CITE
D12	W4.1_WEB_HUB - Public website & documentation hub	Platform	WG4(+MC/Core + WG1-3)	M3, M12	RCO4, CBO2	KPI-HUB-UP
D13	W3.2_APP - Interactive web app (no-code workflows)	Web app	WG3 (+ WG1-2 + Technical Lead)	M38alpha, M43 (release)	RCO3, CBO2	KPI-TTFM
D14	W4.L1_GUIDE_PACK - Harmonised guides + practitioner casebook	Compendium	WG4(+MC/Core + WGs1-3)	M6(v0)/18(v1)/34	RCO5, CBO2	KPI-REV
D15	W4.L2_POLICY_PACK - Policy briefs & consultation notes	Briefs & notes	WG4	M18(v0)/24(v1)	RCO5, CBO2	KPI-POL2Y

D16	W3.4_REPO - Unified repository (MIT, contributing guide)		Repository	WG3 (+ Technical Lead)	M32(v1)/M45	RCO2, CBO6	KPI-REPO-CONTR
D17	W4.5_SOC_CHARTER - European/International Society charter	GAMLSS	Legal & governance docs	MC (+WG4)	M41	RCO8, CBO8	KPI-SOC-GOV
D18	W4.6_PROCEEDINGS - Inaugural conference proceedings & recordings		Proceedings	WG4	M48	CBO8, RCO8	KPI-CBO11

Table 3C. Deliverables catalogue and traceability. Deliverable IDs and titles with type, owner WG, primary Objectives IDs (RCO/CBO), time-frame, and primary KPI IDs, v0 (initial/short), v1 (stable/full).

Section 3.C consolidates all 18 deliverables (D) with type and analytical traceability details. Each deliverable includes explicit acceptance tests keyed to KPIs. IDs match those cited in Section 3.B and KPI codes follow Table 3C (KPI legend) to keep traceability transparent.

KPI registry/legend (grouped by Table 3C deliverables with family tags (*W1-4*), inline for easy tracking, not extensive, in case of discrepancy, the KPI Registry prevails. Any quantitative target stated elsewhere (dates, counts, response times) is non-binding unless registered here as a KPI. Otherwise, it is a milestone/process trigger tracked via KPI-REPORT-OT, recovered per KPI-MTR-ACT.

For MC/Core Group.* (governance, ethics, KPI reporting and oversight): **KPI-GOVPACK** (governance/risk docs updated ≤60 days), **KPI-DPIA-OK** (≥90% DPIA/DUA approvals on time), **KPI-REPORT-OT** (KPI report on schedule at M12/M24/M36/M48), **KPI-MTR-ACT** (≥80% mid-term corrective actions closed by next quarter), **KPI-STAKE** (≥10 active MoUs/engaged organisations per year, (including ≥2 agencies or SMEs, operationalised as ≥5 new institutions each semester)), **KPI-STDS-ADOPT** (standards cited/used ≥3 by M36 and ≥6 by M48).

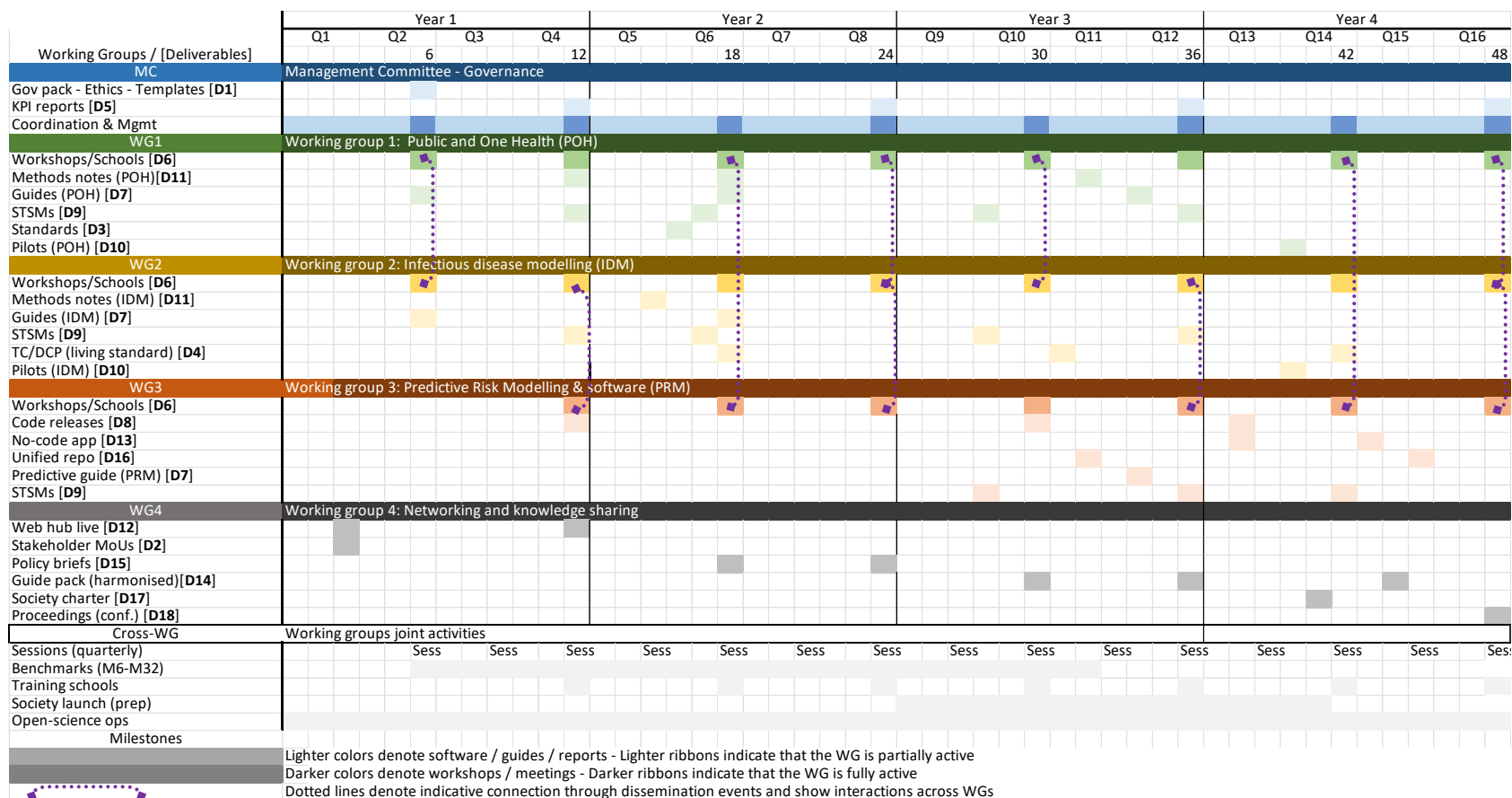
For W123.* (WGs1-3 guides, methods notes, code, standards/TC-DCP, training packs, STSM, pilots, benchmarks): **KPI-REV** (≥2 external expert reviews per guide/book/method note), **KPI-GUIDE-USE** (≥300 downloads/year and ≥5 course adoptions by M48), **KPI-DL** (code/repo downloads ≥200/month by M24 and ≥500/month by M48), **KPI-BENCH** (≥3 cross-domain benchmark datasets with quarterly protocol/scorecards that include ≥2 tail/zero metrics), **KPI-METH-CITE** (≥10 citations/endorsements by M48), **KPI-CASE-ADOPT** (casebook adopted in ≥5 programmes by M48), **KPI-LEARN100** (≥100 unique participants achieve proficiency by M24), **KPI-CMP** (course completion ≥80%), **KPI-RET** (3-month retention ≥60%), **KPI-PLAC10** (≥10 short placements by M36, ≥50% YRI), **KPI-CAREER20** (≥20 YRI co-authored outputs by M48), **KPI-INTEGR2** (≥2 host/national integrations by M48), **KPI-EVAL-COMP** (100% pilot dossiers publish on hub ≤30 days after pilot end).

For W4.* (platforms, policy/communications, MoUs, society & events): **KPI-HUB-UP** (hub uptime ≥99% and new assets posted ≤10 business days after release), **KPI-WEB** (governance/KPI pages live and updated quarterly, plus multilingual abstracts (EN + ≥2 EU languages) and accessibility features by M12), **KPI-TTFM** (≥80% first-time users succeed within 15 minutes on the no-code workflow), **KPI-UP99** (monthly availability ≥99.5%, median Time-To-Recovery ≤30 min), **KPI-REL2Y** (≥2 tagged versioned releases/year for app and repo, delivers cumulative ≥4 workflows by M24), **KPI-REPO-CONTR** (≥5 external contributors/forks by M45), **KPI-POL2Y** (≥2 policy citations/year), **KPI-CONSULT** (≥2 formal consultations/year), **KPI-SOC-MEM** (≥50 paying members 12 months post-charter), **KPI-SOC-GOV** (boards/committees seated and ≥3 meetings/year), **KPI-CBO11** (≥200 attendees with ≥10 YRI speakers and ≥30% ITCs presenters), **KPI-SPONS** (≥€25k sponsorship).

Network-wide balance metrics tracked by MC/Core Group across all deliverables: Group of 4 Action-wide **GBIY (4-pack)**, **KPI-GEO** (≥45 countries by M24 and ≥50 by M48), **KPI-BAL45-55** (gender balance 45-55% across events, STSMs and leadership M18-M24 and onwards), **KPI-ITC** (≥57% by M12 ≥58 by M24, ≥60% by M36, ≥30-40% ITCs participation across events, lead roles, STSM by M24, and ≥60% Training School grants to ITCs from M36), **KPI-YRI**, YRI share: (≥33% M18, ≥35% M24, ≥40% M48).

D. Gantt chart

Implementation schedule (M1–M48): WG1/2 → WG3 → WG4, with MC/Core Group stage-gates,



critical path T1.1/T2.1 → T3.1 → T3.3 → D13 (W3.2_APP), KPI checks and deliverables cross-referenced in Section 3.C. The Gantt shows KPI checkpoints D5 (MC_KPI_REPORT), and deliverables with versioned releases, all cross-referenced in Section 3.C (Figure 1D). Workshops/Schools for WG1-3 relate to D6 (W123.TPACK).

Figure 1D. MAGNET Gantt chart: Working Groups, Deliverables, Activities, Releases, and Cross-Working Group Coordination.