WHITE PAPER

Advancing medical affairs through analytics in the third era

A framework for data-driven transformation in pharma

By Kshitij Sinha and Alex Turok

Impact where it matters.®

The concept of the "third era" in medical affairs highlights a significant transformation: What was once a traditional scientific support function has now evolved into a strategic leadership pillar alongside commercial and R&D, actively shaping organizational success for pharma companies. Modern medical affairs teams are now responsible for generating differentiated medical value, empowering informed clinical decisions, influencing healthcare ecosystems and driving improved outcomes for patients.

In this era, equipping medical affairs teams with medical analytics capabilities is a strategic imperative. The convergence of real-world data (RWD), digital health innovation, AI and evolving healthcare delivery models have the potential to transform how medical affairs operates.

To take advantage of this unprecedented opportunity, ZS has developed a framework for medical analytics that evaluates the current state of organizational maturity compared to the industry. We have also outlined a roadmap to advance an organization's progress toward measurable, scalable and sustainable medical impact.

Why accelerated investment in medical analytics matters right now

Establishing robust medical analytics capabilities is essential for medical affairs to elevate its strategic role and prepare for a future where data drives every decision. Four needs underscore the urgency:

Enabling data-driven medical strategy
RWD and advanced analytics help medical affairs better understand how care is delivered, identify addressable unmet needs and prepare evidence and education to enhance clinical decision-making.

Accelerating insights and decisions
Unlike in commercial teams, medical decision-making relies heavily on unstructured data, such as field notes, medical information call transcripts, literature reviews and advisory board summaries. AI can rapidly analyze these sources and uncover patterns to connect insights. This allows for more precision in scientific decision-making.

Expanding stakeholder engagement
Medical is embracing "engagement at scale." ZS research shows increased activity across nonpersonal, social and paid media channels. This broadens the stakeholder base beyond traditional key opinion leaders (KOLs) to include community physicians and digital opinion leaders. Analytics play a pivotal role in helping medical affairs tailor engagement across this diverse ecosystem. This precision increases the likelihood of n=1 impact for individual healthcare professionals (HCPs).

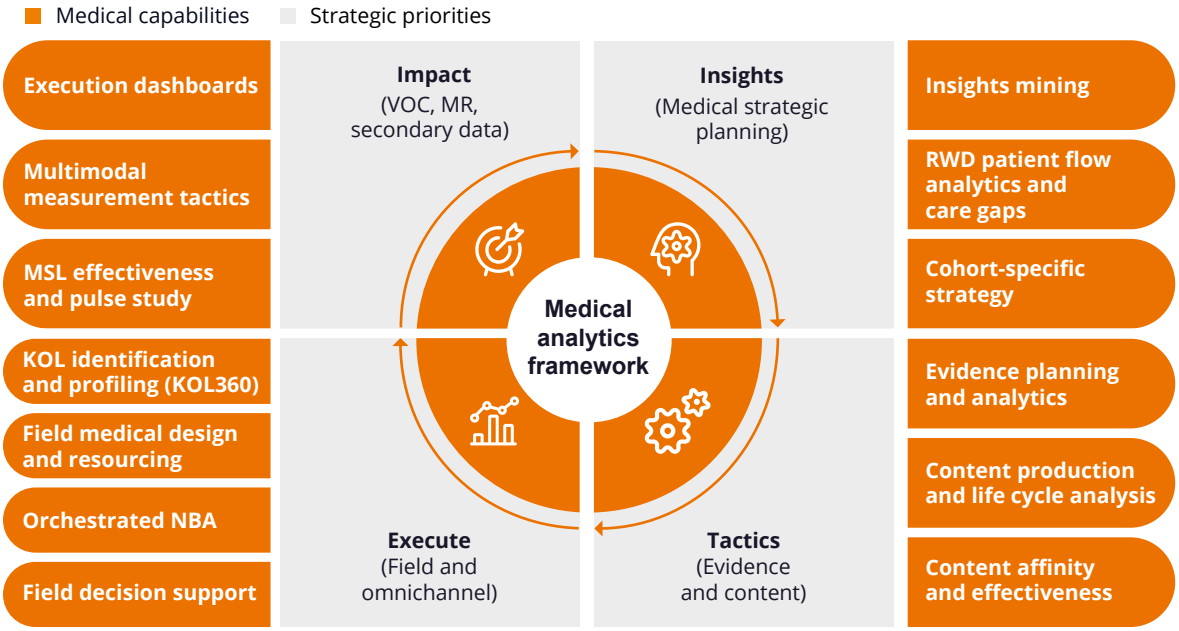
Measuring and demonstrating impact
Advanced analytics support compliant, data-driven measurement of medical impact, focusing on strategies and activities that matter most to HCPs and patients.

A framework for medical analytics

Best-in-class (the top 10%) organizations are using medical analytics in four key areas: insights, tactics, execution and impact. By connecting these areas to business objectives, they improve decision-making, strategy and patient outcomes.

FIGURE 1:

The ZS medical affairs analytics framework for the third era



Source: ZS Medical Analytics Framework; ZS Point-of-View

1. Insights: From data collection to intelligence

The commercial function within a pharma organization invests millions in physician market research, while medical science liaisons (MSLs) spend an average of 30 minutes per interaction with KOLs. MSL interactions provide a continuous stream of "free" market insights that can directly shape unified asset strategy. Further, patient journeys are often developed too late in the life cycle.

Medical affairs should own patient journeys and use RWD layered with literature and expertise to identify deviations from guidelines. This can uncover true unmet needs that can redefine an asset's trajectory and elevate the target product profile. Too often, medical decisions rely on small sample inputs, such as congress feedback or advisory boards. By integrating diverse data sources, uncovering unseen connections and broadening the analysis to include more treaters, medical affairs can strengthen strategic decision-making in both product positioning and perception shaping. This approach moves the pharma organization from mere information to actionable insights.

Currently, AI-enabled analytics are revolutionizing insights generation through:

- Generative AI and natural language querying, which allow teams to interrogate complex datasets and generate insights.
- Chat-based smart assistants that empower field teams to respond to HCP queries in real time.
- Advanced analytics adoption to map patient journeys using RWD to identify care patterns and variations. Advanced analytics can quantify clinical care gaps and tailor scientific narratives to specific patient cohorts.
- HCP-level segmentation that combines scientific preferences, practice patterns and engagement behaviors.

2. Tactics: Optimizing evidence and content strategies

Medical affairs teams are making significant strides in evidence strategy, yet analytics capabilities at many organizations are nascent. To move forward, organizations can use both a prospective approach to help guide decisions on investment and effort priorities and a retrospective approach to evaluate the outcomes of executed evidence plans. This process produces insights that can inform future strategies.

Advanced analytics empower medical affairs teams to:

- Prioritize evidence investments by identifying gaps with the greatest potential to affect patient outcomes.
- Assess evidence plan effectiveness retrospectively to inform future strategy.
- Quantify the influence of evidence generation on HCP behavior, inquiry and advocacy.

As medical teams generate increasingly sophisticated evidence, the need to translate this information into relevant, accessible and timely scientific content will only intensify. At the same time, the sheer volume and complexity of scientific literature, clinical trial data and real-world evidence (RWE) pose growing challenges for medical affairs teams that need to efficiently synthesize and disseminate meaningful insights.

AI and advanced analytics can significantly transform this landscape. For example:

- Generative AI can automate summaries of scientific documents, allowing teams to produce tailored scientific narratives for specific audiences, from KOLs to community HCPs.
- Smart content orchestration platforms use AI and machine learning to recommend optimal content formats and channels for different HCP segments based on historical engagement data and predicted preferences.
- AI-driven modular content frameworks allow teams to assemble and localize scientific materials quickly, which encourages scalable and efficient digital engagement.

Analytics also equip organizations to move from reactive content delivery to proactive optimization. This includes managing the content life cycle to assess which assets drive engagement and determining which should be retired or repurposed. Organizations can measure scientific impact metrics, such as knowledge lift and shifts in perception, to evaluate the effectiveness of their content dissemination strategies. Through analytics-enabled content strategies, medical affairs can ensure that the right scientific message reaches the right stakeholder, through the right channel, at the right time—maximizing impact and advancing clinical practice.

3. Execute: Transforming scientific engagement

Field medical remains the largest area of investment for medical affairs, yet results are uneven. A ZS benchmark study shows KOLs are willing to engage twice as often with the best-performing MSLs compared to the lowest-performing MSLs. The best MSLs are also 36% more likely to provide relevant information and 30% more likely to respond promptly. Improving MSL performance using enhanced context, targeted planning and AI-guided prioritization can lead to estimated productivity savings of between $50 million and $100 million.

Pharma organizations are transforming scientific engagement by investing in capabilities across pre-engagement planning, to near-engagement support, to post-engagement next steps. ZS Medical Affairs Outlook Report 2025 suggested that 66% of MSLs still rely on intuition and past relationships for pre-engagement planning. Further, digital literacy is emerging as one of the most critical future skills for MSLs. Consumable AI and focused training will be key to building adoption and value. Analytics and AI can help elevate field effectiveness and transform field medical by:

- Building HCP 360° profiles, integrating engagement histories, RWD insights and behavioral segmentation to support strategic prioritization.
- Enabling digital augmentation to expand outreach within the community to inform real-world clinical decisions.
- Deploying conversational AI engines to deliver medical, legal and regulatory-approved, HCP-specific content aligned with patient care events.
- Training MSLs in digital literacy and AI fluency, including simulated MSL trainers with scenario-based learning journeys.

Leading pharma organizations are also investing in omnichannel engagement strategies, optimizing content delivery across platforms like Doximity, Medscape and epocrates, as well as internal portals, to create an integrated customer experience.

4. Impact: Measuring what matters

Measuring the true impact of medical affairs has always been complex, but we've seen meaningful progress over the last few years. Unlike commercial functions, medical affairs lacks a single North Star metric to gauge its full contribution. And driving change in clinical practice often requires multiple data disclosures and sustained HCP engagement, making direct attribution difficult.

ZS Medical Affairs Patient Outcomes Impact (POI™) Framework recognizes that medical impact unfolds over four horizons:

- **Horizon 1: Activity tracking.** Measuring tactical execution, such as the number of engagements, scientific presentations or medical info inquiries.
- **Horizon 2: Shifts in HCP knowledge and beliefs.** Assessing awareness, understanding and perceptions aligned with key scientific narratives.
- **Horizon 3: HCP behavior change.** Observing how shifts in knowledge translate into changes in prescribing patterns, diagnostic practices or patient management approaches. These can be triangulated across MSL-reported insights, HCP-reported feedback and market research insights.
- **Horizon 4: Impact on clinical practice and outcomes.** Evaluating whether these changes ultimately improve patient care and health outcomes at scale. This means that strategies can be adjusted or retired once it is clear—through multiple analysis instruments—that a significant clinical care gap has been addressed.

Advanced analytics and AI are helping medical affairs move beyond activity-focused metrics toward strategic, outcome-driven measurements that align with organizational goals. In parallel, top pharma organizations are adopting RWD, advanced analytics models and AI to:

- Demonstrate impact holistically by measuring progress against medical strategic priorities and triangulating data across multiple measurement instruments.
- Integrate leading and lagging indicators to provide a more complete picture of medical impact across the four horizons of the ZS Medical Affairs POI Framework.
- Conduct sentiment analysis from unstructured MSL notes data and HCP surveys to detect shifts in scientific understanding or attitudes.
- Recommend optimal medical channel investments by analyzing the effectiveness and relative impact of different initiatives, such as field engagements, publications, advisory boards and digital channels.

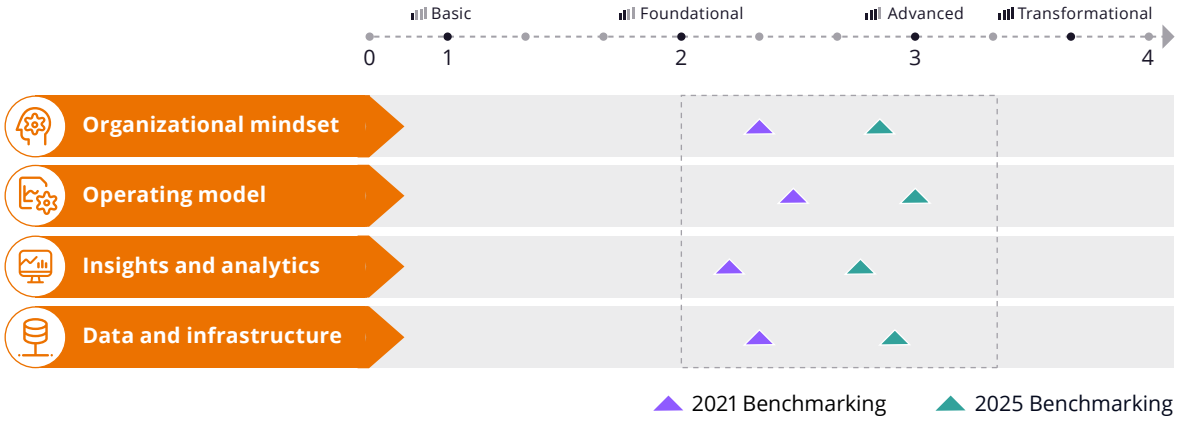
By embedding analytics at the core of impact measurement, organizations are equipping medical affairs to demonstrate value, adjust strategies dynamically and elevate its role in driving patient outcomes.

Industry maturity: Medical analytics momentum is building

As ZS's Medical Affairs Outlook Report 2025 found, approximately 71% of medical affairs organizations rate their data-driven decision-making maturity as evolving (up from 64% in 2023), while only about 13% consider themselves best in class.

FIGURE 2:

Medical analytics organization benchmarking



Source: ZS Medical Affairs Benchmarking; ZS Point-of-View

Each dot represents median score across 15 pharma companies representing across mid- to large-size pharma organizations.

Since 2023, however, medical affairs organizations have significantly advanced their analytics capabilities, a transformation propelled by several key catalysts, including:

- **Formalized analytics org structures.** Mid- and large-sized pharma companies have consistently established dedicated medical analytics functions like their commercial counterparts. This evolution underscores a growing recognition of analytics as an enabler for strategic decision-making and operational efficiency. But the spectrum of adoption across the industry is broad. While some companies have invested heavily in building dedicated teams, platforms and governance, others are just starting to build these capabilities.
- **New operating model and ways of working.** Medical affairs teams are adopting consistent, standardized processes across therapeutic areas, defining clear roles, responsibilities and governance for analytics within both global and affiliate operations. Global capability centers are playing a growing role in accelerating scale and efficiency, although their integration with core medical affairs strategy remains variable.

- **Insights and analytics.** Teams are developing a dynamic library of analytics use cases that systematically prioritize initiatives that deliver the greatest scientific and strategic impact.
- **Data and partnerships.** Pharma companies are increasingly tapping into diverse datasets, such as claims data, electronic health records, lab results, patient-generated health data and social drivers of health, to expand their analytics use cases. Yet ownership and governance of key data sources are often fragmented, creating internal bottlenecks. Medical affairs teams must negotiate expanded third-party agreements and establish clear internal governance to maximize the utility of data for their use cases.

A roadmap for an integrated and intelligent analytics ecosystem

By consolidating disparate data sources into a unified, cloud-native analytics ecosystem, organizations can seamlessly integrate RWD, field engagement platforms and CRM systems into a scalable single source of truth that supports AI-powered workflows such as generative content creation, natural language querying and predictive modeling. But truly achieving best-in-class analytics maturity demands that organizations invest in company culture, governance and capabilities. Pharma companies should:

1. **Embed analytics as a core strategic capability**
   To be successful, pharma organizations need to embed analytics deeply into everything medical affairs does, from strategy, planning and field execution to measuring impact. To achieve this shift, pharma organizations must cultivate analytics fluency through ongoing training, engage leadership at every level and adopt AI responsibly. Leaders and teams should use analytics to inform decisions, whether they're prioritizing evidence generation, tailoring HCP engagement, optimizing content dissemination or measuring the impact of medical affairs initiatives.

2. **Implement sound governance, compliance and ethical AI use**
   As medical affairs embraces RWD and AI, organizations must establish governance frameworks to ensure they comply with regulatory standards, protect data privacy and use AI technologies ethically. By consolidating fragmented front-end tools, chatbots and analytics workbenches into a unified, standardized ecosystem, teams reduce reliance on point solutions while creating a single coherent narrative for global stakeholders.

3. **Practice change management to advance analytics adoption**
   ZS's 2025 research suggests the average adoption level of generative AI is 3.3 out of 7. To improve adoption, medical affairs will need to employ change management strategies to encourage their workforce to embrace digital and AI tools and evolve into an adaptive learning organization. When they do, medical affairs will grow their capabilities to achieve:

   - AI-augmented decision support that empowers MSLs with predictive insights that personalize scientific exchange and anticipate clinical needs.
   - Precision engagement using behavioral and clinical segmentation and RWE to deliver targeted, relevant medical education and scientific content.
   - Continuous optimization of medical strategy, achieved by feeding real-time data from field interactions, digital channels and patient outcomes back into strategic decision-making.
   - Evidence-driven impact by prioritizing clinical evidence development and dissemination. This will be guided by AI-identified practice gaps and unmet patient needs to accelerate meaningful change in clinical practice.

At ZS, we envision a connected, intelligent medical affairs function that goes beyond support to actively shape clinical care—one driven by data-informed strategy, scientific rigor and real-world impact.

About the authors

Kshitij Sinha is an associate principal at ZS who leads the medical analytics and AI horizontal for the global ZS medical and evidence practice area. He has led several engagements spanning go-to-market strategy, launch excellence, field organization design and enablement, digital medical omnichannel orchestration and impact measurement and reporting. Kshitij has helped clients enhance their scientific engagement model, elevate evidence generation capabilities and automate customer insights by harnessing the power of data and analytics.

Alex Turok is a principal at ZS, where he leads the integrated evidence strategy and planning service line and medical affairs for Americas-East. He helps clients deliver a differentiated evidence package to external healthcare stakeholders. Alex also focuses on bringing innovative solutions and building a deep community of experts who can support functional transformation.

About ZS

ZS is a management consulting and technology firm that partners with companies to improve life and how we live it. We transform ideas into impact by bringing together data, science, technology and human ingenuity to deliver better outcomes for all. Founded in 1983, ZS has more than 13,000 employees in over 35 offices worldwide.

Learn more: www.zs.com