

AYURVEDIC PHENOTYPING: A FRAMEWORK FOR INDIVIDUALIZED DISEASE DIAGNOSIS

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ABSTRACT

Ayurveda is a holistic system of medicine that emphasizes individualized assessment of health and disease based on the unique constitution and clinical characteristics of an individual. The concept of Ayurvedic phenotype can be understood as the systematic representation of an individual's observable and clinically relevant characteristics through classical Ayurvedic parameters. These include *Prakriti* (innate constitution), *Vikriti* (current pathological state), *Dosha* (bio-humor), *Dushya* (vitiated tissue), *Agni* (digestive-metabolic fire), *Ama* (undigested metabolic by-product), *Srotas* (body channels), *Koshtha* (nature of bowel), *Bala* (strength), and other clinical features described in Ayurvedic diagnostic frameworks. Unlike a disease-centred approach, Ayurvedic assessment attempts to identify individual variations in disease manifestation and pathogenesis, thereby supporting personalized diagnosis and

management. This paper proposes Ayurvedic Phenotype as a framework for individualized disease diagnosis, integrating classical Ayurvedic principles with a structured and systematic approach to clinical assessment. The framework aims to organize subjective and qualitative Ayurvedic observations into clearly defined and reproducible phenotypic features. Such standardization may facilitate comparison between individuals, identification of disease-specific patterns, and objective documentation of Ayurvedic clinical findings. Ayurvedic phenotyping may therefore serve as a bridge between traditional individualized diagnosis and

contemporary approaches to personalized medicine. A standardized phenotypic framework has the potential to enhance diagnostic consistency, facilitate clinical research, and contribute to the wider scientific evaluation of personalized Ayurvedic healthcare. Further validation through larger, multicentric, and clinically diverse studies is required to establish its reliability, diagnostic utility, and applicability across different diseases and populations.

KEYWORDS: Ayurveda, Ayurvedic Phenotype, Individualized Diagnosis, Personalized Medicine, *Prakriti*.

1. INTRODUCTION

Ayurveda is a traditional system of medicine that emphasizes the maintenance of health and the prevention and management of disease through an individualized understanding of the human being. One of the distinctive features of Ayurvedic clinical practice is that disease is not considered in isolation from the individual in whom it occurs. The assessment of a patient involves consideration of constitutional characteristics, physiological status, pathological alterations, causative factors, *Dosha* (bio-humor) involvement, affected tissues, metabolic status, and clinical manifestations. The Ayurvedic approach to diagnosis is therefore multidimensional. Concepts such as *Prakriti* (innate constitution), *Vikriti* (current pathological state), *Dosha*, *Dushya* (vitiated tissue), *Agni* (digestive-metabolic fire), *Ama* (undigested metabolic by-product), *Srotas* (body channels), *Bala* (strength), *Satmya* (habituation), *Desha* (habitat), *Kala* (time/season), *Nidana* (etiological factors) and *Samprapti* (pathogenesis) provide different dimensions for understanding the individual and the disease process. Consequently, two individuals presenting with the same disease may demonstrate considerable variation in their constitutional characteristics, pathological patterns, symptom expression, and clinical course.^[1]

In contemporary healthcare, increasing attention is being directed towards individualized and personalized approaches to diagnosis and management. Modern phenotyping broadly refers to the systematic characterization of observable characteristics of an individual or population. In this context, the concept of Ayurvedic phenotyping can provide a framework for systematically representing an individual's clinical characteristics according to Ayurvedic principles. Ayurvedic phenotyping does not propose a new diagnostic principle independent of classical Ayurveda. Rather, it seeks to organize and systematically represent the multidimensional information already obtained through Ayurvedic clinical assessment. It may

therefore provide a conceptual framework for describing how constitutional and pathological characteristics combine to produce an individual's unique clinical presentation.

2. Concept of Ayurvedic Phenotyping

The term phenotype broadly refers to the observable characteristics of an individual resulting from the interaction of intrinsic characteristics and environmental influences. When this concept is considered within the Ayurvedic framework, the observable clinical characteristics of an individual can be interpreted through the fundamental principles of Ayurveda.

Ayurvedic phenotyping may therefore be defined as:

“The systematic characterization and documentation of an individual's constitutional, physiological, pathological, and clinically observable features using relevant Ayurvedic principles and diagnostic parameters.”

The Ayurvedic phenotype is not restricted to a single parameter. It represents a multidimensional profile consisting of both relatively stable characteristics and dynamic changes associated with disease.

A conceptual representation can be expressed as:

Ayurvedic Phenotype = Constitutional Characteristics + Functional Status + Pathological Characteristics + Clinical Manifestation.

Thus, an Ayurvedic phenotype may include:

Prakriti, Vikriti, Dosha, Dushya, Agni, Ama, Srotas, Bala, Satmya, Nidana, Samprapti clinical signs and symptoms findings obtained through Ayurvedic examination.

3. Rationale for Ayurvedic Phenotyping

The need for Ayurvedic phenotyping arises from the complex and individualized nature of Ayurvedic diagnosis. A conventional disease label provides information about the disease entity, but it may not adequately represent the complete clinical characteristics of the individual. For example, two individuals may have the same disease diagnosis but differ in:

Prakriti, Dosha, predominance, *Agni*, presence or absence of *Ama, Dushya* involvement, *Srotas* involvement, disease stage, severity, associated symptoms and physical examination findings. From an Ayurvedic perspective, these differences may be clinically meaningful.^[2]

Therefore, Ayurvedic phenotyping may help to move from a disease-centred description towards an individual-centred characterization.

The conceptual progression may be represented as:

Individual → *Prakriti* → *Vikriti* → *Dosha* → *Dushya* → *Agni* → *Ama* → *Srotas* → *Samprapti* → Clinical Features → Ayurvedic Phenotype

This approach allows the individual clinical pattern to be documented in addition to the disease diagnosis.

4. Objectives of Ayurvedic Phenotyping

The proposed framework may have the following objectives:

1. To systematically characterize an individual's clinical profile according to Ayurvedic principles.
2. To integrate constitutional and pathological parameters into a structured phenotype.
3. To describe variations in disease manifestation among individuals.
4. To improve the systematic documentation of Ayurvedic clinical findings.
5. To facilitate comparison of Ayurvedic clinical patterns between individuals and populations.
6. To provide a conceptual framework for research on individualized Ayurvedic diagnosis.
7. To facilitate the development and validation of standardized Ayurvedic assessment parameters.

5. Components of the Ayurvedic Phenotyping Framework

The proposed framework consists of interconnected domains that collectively describe the Ayurvedic phenotype of an individual.

5.1 *Prakriti*: The Constitutional Domain

Prakriti represents the individual's inherent constitutional characteristics. It is considered to be established at the beginning of life and remains relatively stable throughout an individual's lifetime.

The assessment may include:

Vata (governing movement) *Prakriti*

Pitta (governing transformation) *Prakriti*

Kapha (governing cohesion) *Prakriti*

Dvandvaja (dual-Dosha) *Prakriti*

Tridoshaja (three-Dosha) *Prakriti*

Prakriti provides the baseline constitutional context of the individual.

Within Ayurvedic phenotyping, *Prakriti* can therefore be considered an important foundational component because it provides a reference against which subsequent physiological and pathological changes may be interpreted.

6. *Vikriti*: The Dynamic Pathological Domain

While *Prakriti* represents the individual's constitutional state, *Vikriti* represents the current deviation from equilibrium.

Vikriti may involve alterations in:

Dosha, *Agni*, *Dhatu* (body tissues), *Mala* (waste products), *Srotas*, and other physiological or pathological processes.^[3]

Therefore:

Prakriti = Baseline constitutional profile

Vikriti = Current altered/pathological profile

The comparison between *Prakriti* and *Vikriti* can provide important information about the nature of an individual's current disease state.

7. *Dosha* Phenotype

Dosha is a fundamental component of Ayurvedic physiology and pathology.

The three *Doshas*—*Vata*, *Pitta* and *Kapha*—are associated with different functional characteristics. Disease manifestation may vary according to the *Dosha* involved and the nature of its disturbance. Ayurvedic phenotyping may therefore document:

predominant *Dosha*,

aggravated *Dosha*,

Dosha combination,

site of *Dosha* involvement,

associated clinical manifestations.

The same disease entity may therefore be expressed through different *Dosha*-dominant patterns.

For example, a particular disorder may manifest predominantly with *Vata*-related characteristics in one individual and with *Kapha*-related characteristics in another.

This provides a basis for describing intra-disease heterogeneity within an Ayurvedic.

8. *Dushya* and *Dhatu* Phenotype

Disease manifestation involves not only *Dosha* but also the tissues or substrates affected by the pathological process.

The relevant *Dushya* may include:

Rasa (plasma), *Rakta* (blood), *Mamsa* (muscle), *Meda* (adipose tissue), *Asthi* (bone), *Majja* (bone marrow), *Shukra* (male reproductive tissue)/*Artava* (female reproductive tissue)

as applicable to the disease condition.

Assessment of *Dushya* involvement provides information regarding the tissue level at which pathological processes are expressed.

Thus, the combination:

Dosha + *Dushya* + *Sthana* (site)

may provide a more comprehensive representation of the pathological context than *Dosha* assessment alone framework.

9. *Agni* Phenotype

Agni is a central concept in Ayurveda and is associated with digestion and metabolic transformation. Clinical assessment may identify different patterns such as:

Sama Agni (balanced digestive fire)

Manda Agni (low digestive fire)

Tikshna Agni (intense digestive fire)

Vishama Agni (irregular digestive fire).

Variation in *Agni* may influence the individual's physiological state and susceptibility to pathological processes.

Therefore, *Agni* may represent an important component of the Ayurvedic phenotype.

For example, individuals with similar disease diagnoses may demonstrate different *Agni* patterns, which may contribute to differences in clinical presentation and disease progression.

10. *Ama* Phenotype

Ama represents an important pathological concept in Ayurveda, particularly in conditions associated with impaired digestion and metabolism.

Within Ayurvedic phenotyping, *Ama* may be documented according to:

presence or absence, associated clinical features, relationship with *Dosha*, extent of involvement, relationship with disease stage.

The assessment of *Ama* may therefore contribute to characterization of the individual's pathological state. It is particularly relevant in disorders where the Ayurvedic understanding of pathogenesis includes the interaction of *Ama* with *Dosha* and other pathological factors.

11. Srotas Phenotype

Srotas represent channels or pathways involved in the transportation and functioning of substances and processes within the body.

Assessment of *Srotas* may include:

affected *Srotas*, type of *Srotodushti* (vitiation of channels), site of involvement, associated *Dosha*, associated *Dushya*, relevant clinical manifestations.

Srotas-based characterization can therefore provide information about the anatomical and functional context of disease manifestation.

12. Nidana and Exposure Profile

Nidana represents the etiological factors associated with disease development.

The phenotyping framework may document relevant:

dietary factors, lifestyle factors, environmental factors, behavioural factors, occupational factors, seasonal influences, psychological factors and other relevant exposures.

This allows the phenotype to be considered within the broader context of the individual's interaction with internal and external factors.

13. Samprapti-Based Characterization

Samprapti describes the process through which disease develops and manifests.

It provides information regarding:

Dosha involvement, *Dushya* involvement, *Srotas*, site of manifestation, stages of disease development, and progression of pathological processes.

Including *Samprapti* in Ayurvedic phenotyping ensures that the framework does not merely describe isolated clinical characteristics but also incorporates the pathophysiological context in which those characteristics arise.

14. Clinical Phenotype

The final expression of the Ayurvedic phenotype is represented by observable clinical findings.

These may include findings obtained through:

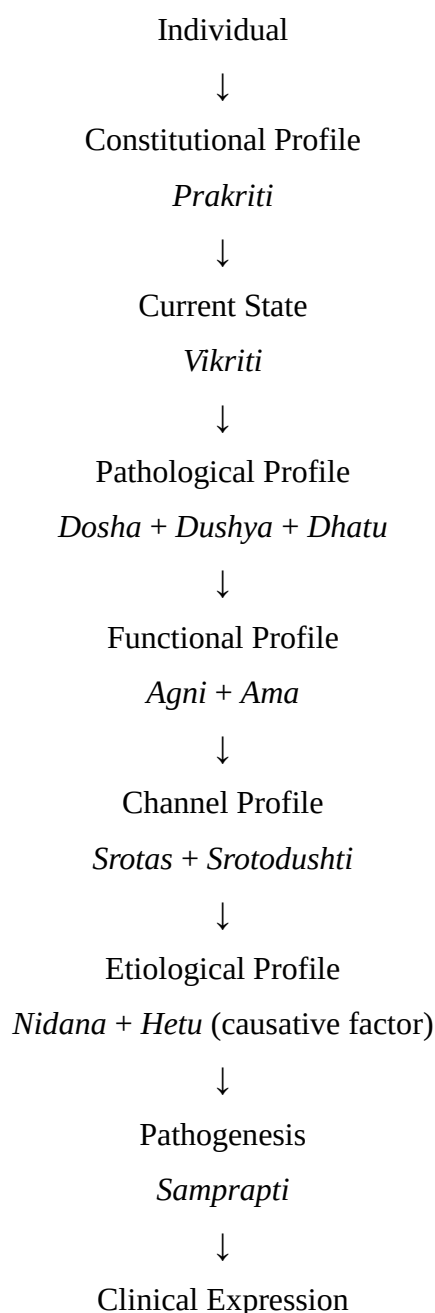
Ashtavidha Pariksha (eightfold clinical examination)

Nadi (pulse), *Mutra* (urine), *Mala*, *Jihva* (tongue), *Shabda* (speech/sound), *Sparsha* (touch), *Drik* (eyes), *Akriti* (body build) Other clinical parameters appetite, sleep, bowel habits, urinary pattern, body strength, physical examination, signs and symptoms, disease severity, and disease-specific observations.

These findings represent the observable expression of the individual's constitutional and pathological state.

15. Proposed Framework

The proposed Ayurvedic phenotyping framework can be represented as:



Signs + Symptoms + Examination Findings



Ayurvedic Phenotype



Individualized Disease Characterization

This framework emphasizes that the final phenotype is the result of the interaction of multiple dimensions rather than a single diagnostic variable.

16. Ayurvedic Phenotyping and Disease Diagnosis

Disease diagnosis and phenotyping represent related but distinct processes.

Disease diagnosis primarily seeks to identify the disease entity.

Phenotyping seeks to describe the characteristics through which that disease is expressed in a particular individual.

Thus:

Disease Diagnosis → What disease does the individual have?

Ayurvedic Phenotyping → How is that disease expressed in this individual according to Ayurvedic parameters?

For example, two individuals may have the same biomedical diagnosis but may have different:

Prakriti, *Vikriti*, *Dosha* involvement, *Agni*, *Ama*, *Dushya*, *Srotas*,
and clinical manifestations.^[4]

Their Ayurvedic phenotypes would therefore not necessarily be identical.

17. Ayurvedic Phenotyping and Individualized Diagnosis

Individualized diagnosis is an important characteristic of Ayurvedic clinical reasoning.

The Ayurvedic clinician does not necessarily assess a disease in isolation but evaluates the disease in relation to:

Rogi (patient) + *Roga* (disease)

where the characteristics of the patient and the characteristics of the disease are considered together.

Ayurvedic phenotyping may provide a structured representation of this approach.

A simplified model may therefore be expressed as:

Rogi Pariksha (examination of the patient) + *Roga Pariksha* (examination of the disease) →
Individualized Ayurvedic Phenotype

This may facilitate a more comprehensive characterization of patients with the same disease but different clinical patterns.^[5]

18. Ayurvedic Phenotyping and Personalized Medicine

Contemporary personalized medicine recognizes that individuals with the same disease may differ in susceptibility, disease expression, prognosis, and response to interventions.

Ayurveda has historically emphasized individual variation through assessment of:

Prakriti, Vikriti, Dosha, Agni, Bala, Satmya, Desha, Kala, and other patient-specific characteristics.

The concept of Ayurvedic phenotyping therefore provides a framework for articulating this individualized orientation in a systematic manner.

However, it is important to distinguish conceptual similarity from scientific equivalence. Ayurvedic phenotyping should not be presented as synonymous with contemporary precision medicine unless specific relationships have been scientifically established.

19. Standardization of Ayurvedic Phenotyping

Standardization is essential for transforming a conceptual framework into a reproducible research methodology.

19.1 Operational Definitions

Each Ayurvedic parameter should have a clearly defined operational meaning.

For example, terms such as:

Sama Agni, Manda Agni, Ama, Sama Jihva (coated tongue), *Dosha* predominance, should be accompanied by predefined assessment criteria.

19.2 Structured Assessment

Clinical findings should be documented using standardized assessment forms or structured data collection systems.

19.3 Grading

Where appropriate, clinical features may be classified according to defined grades or categories.

19.4 Reliability

The framework should be evaluated for:

intra-observer reliability, inter-observer reliability, test-retest reliability.

19.5 Validity

Appropriate studies should investigate, construct validity, criterion validity where applicable, content validity, discriminative ability.

19.6 Reproducibility

A clinically useful phenotyping system should produce sufficiently consistent results when applied by trained observers under comparable conditions.

20. Potential Applications

The proposed framework may have several potential applications.

20.1 Clinical Documentation

It may provide a structured format for recording multidimensional Ayurvedic findings.

20.2 Individualized Disease Characterization

It may help characterize differences between patients with the same disease.

20.3 Clinical Research

Standardized phenotypes may facilitate comparison of clinical patterns between study populations.

20.4 Disease Stratification

Patients may potentially be classified into clinically meaningful Ayurvedic phenotype groups.

20.5 Longitudinal Monitoring

Changes in the Ayurvedic phenotype may potentially be documented during disease progression or treatment.

20.6 Research Standardization

A standardized framework may facilitate multicentric studies by providing common definitions and assessment categories.

21. Example of Ayurvedic Phenotyping

A hypothetical example may illustrate the concept.

Consider two individuals diagnosed with the same chronic inflammatory joint disorder.

Individual A

Vata-dominant *Prakriti*

Vata aggravation

Vishama Agni

specific *Dushya* involvement

characteristic *Srotas* involvement

symptoms predominantly reflecting *Vata* characteristics.

Individual B

Kapha-dominant *Prakriti*

Kapha-associated pathological features

Manda Agni

Ama-associated manifestations

different clinical expression.

Although both individuals may have the same disease diagnosis, their Ayurvedic phenotypes are different.

This demonstrates the potential value of phenotyping in describing individual variation within a disease category.^[6]

22. Research Methodology for Validation

Although Ayurvedic phenotyping is primarily proposed as a conceptual framework, its scientific evaluation would require systematic research.

Future studies may include:

Phase I: Concept Development

Identification of relevant Ayurvedic parameters through classical literature and expert consensus.

Phase II: Operationalization

Development of standardized definitions and assessment criteria.

Phase III: Reliability Testing

Assessment of inter- and intra-observer agreement.

Phase IV: Clinical Characterization

Application of the framework to individuals with specific diseases and healthy controls.

Phase V: Phenotype Identification

Identification of recurring combinations or patterns of Ayurvedic characteristics.

Phase VI: Validation

Evaluation of whether identified phenotypes demonstrate meaningful associations with clinical outcomes, disease characteristics, prognosis, or other predefined variables.

This stepwise approach would help prevent premature classification of the framework as a validated diagnostic instrument.^[7]

23. DISCUSSION

The proposed concept of Ayurvedic phenotyping is rooted in the individualized nature of Ayurvedic diagnosis. Classical Ayurvedic assessment incorporates multiple dimensions of the individual, including constitutional characteristics, current pathological alterations, *Dosha* status, affected tissues, metabolic function, pathological products, channels, etiological factors, and clinical manifestations. The major conceptual contribution of Ayurvedic phenotyping is the integration of these dimensions into a structured individual profile. *Prakriti* may provide the baseline constitutional context, while *Vikriti* represents the current deviation from that baseline. *Dosha* and *Dushya* provide information regarding the pathological interaction, whereas *Agni* and *Ama* contribute to the assessment of functional and pathological status. *Srotas* and *Samprapti* further contextualize the location and progression of disease. Clinical examination then provides the observable expression of these processes. This framework may be particularly relevant to diseases in which substantial clinical heterogeneity exists. Individuals sharing the same disease diagnosis may exhibit different combinations of constitutional and pathological features. A phenotype-based approach may therefore offer a more detailed description of individual variation. An important consideration, however, is the standardization of qualitative Ayurvedic observations. Several Ayurvedic parameters depend upon clinical interpretation and experience. Without clearly defined criteria, variations between observers may reduce reproducibility. Therefore, standardization should be regarded as an essential component of Ayurvedic phenotyping. The framework should also avoid reducing Ayurveda to isolated measurable variables. The purpose of phenotyping should not be to fragment Ayurvedic concepts but to systematically document their multidimensional clinical relationships. Accordingly, Ayurvedic phenotyping should initially be regarded as a conceptual and research framework. Its transition into a validated clinical methodology requires empirical evidence demonstrating reliability, validity, clinical relevance, and applicability across different diseases and populations.^[8]

24. Strengths of the Proposed Framework

The proposed framework has several conceptual strengths:

1. Individual-centred approach: It places the individual at the centre of clinical characterization.
2. Multidimensional assessment: It incorporates multiple Ayurvedic diagnostic domains.
3. Integration of constitution and pathology: It considers both *Prakriti* and *Vikriti*.
4. Recognition of disease heterogeneity: It allows variation among individuals with the same disease to be described.
5. Research applicability: Standardized phenotypes may facilitate comparative clinical research.
6. Compatibility with Ayurvedic principles: The framework is derived from established Ayurvedic diagnostic concepts rather than introducing an entirely independent diagnostic system.^[9]

25. LIMITATIONS

Several limitations should be acknowledged.

1. Ayurvedic phenotyping is currently a conceptual framework and requires empirical validation.
2. Many Ayurvedic parameters are qualitative or semi-quantitative.
3. Variability in interpretation among practitioners may affect reproducibility.
4. Different classical sources may provide variations in terminology and clinical interpretation.
5. Operationalizing complex Ayurvedic concepts without oversimplifying them presents a methodological challenge.
6. The relationship between Ayurvedic phenotypes and contemporary disease classifications remains to be systematically established.
7. Large, multicentric and longitudinal studies are required to determine the reliability and generalizability of the framework.

26. FUTURE Perspectives

Future research should focus on developing a scientifically robust and clinically applicable Ayurvedic phenotyping system.

Priority areas may include:

1. development of standardized operational definitions;
2. creation of validated assessment scales;
3. development of structured phenotyping forms;

4. assessment of inter-observer and intra-observer reliability;
 5. identification of reproducible phenotype patterns;
 6. disease-specific phenotyping studies;
 7. multicentric validation;
 8. longitudinal assessment of phenotype changes;
 9. evaluation of associations between phenotype and clinical outcomes;
 10. assessment of the relationship between Ayurvedic phenotypes and treatment response.
- Particular attention should be given to ensuring that standardization improves reproducibility without losing the contextual and holistic nature of Ayurvedic clinical reasoning.

27. CONCLUSION

Ayurvedic phenotyping may be proposed as a structured framework for individualized disease characterization based on classical Ayurvedic principles. It integrates *Prakriti*, *Vikriti*, *Dosha*, *Dushya*, *Agni*, *Ama*, *Srotas*, *Nidana*, *Samprapti* and clinical manifestations to construct a multidimensional representation of an individual's clinical state. The framework emphasizes that a disease diagnosis alone may not fully describe the individual in whom the disease occurs. Ayurvedic phenotyping therefore provides a conceptual shift from disease identification alone to characterization of individual patterns of disease expression. The proposed framework is not intended to replace classical Ayurvedic diagnosis; rather, it aims to organize and standardize the information generated through Ayurvedic clinical assessment. Its scientific utility will depend upon the development of operational definitions, reproducible assessment methods, and rigorous validation. Thus, Ayurvedic phenotyping may represent a promising conceptual framework for individualized disease diagnosis and for systematic research into the heterogeneity of disease manifestation within Ayurveda. Further clinical and methodological research is necessary to determine its reliability, validity, diagnostic utility, and applicability across diverse diseases and populations.

REFERENCES

1. Charaka. *Charaka Samhita*, with *Ayurveda Dipika* commentary of Chakrapani Datta. Chaukhambha Sanskrit Sansthan, Varanasi.
2. Sushruta. *Sushruta Samhita*, with *Nibandha Sangraha* commentary of Dalhana. Chaukhambha Sanskrit Sansthan, Varanasi.
3. Vagbhata. *Ashtanga Hridaya*, with *Sarvangasundara* commentary of Arunadatta. Chaukhambha Orientalia, Varanasi.

4. Madhavakara. *Madhava Nidana*, with *Madhukosha* commentary. Chaukhambha Sanskrit Sansthan: Varanasi.
5. Sharma PV. *Charaka Samhita*. Chaukhambha Orientalia: Varanasi.
6. World Health Organization. WHO Traditional Medicine Strategy. World Health Organization, Geneva.
7. Ashley EA. Towards precision medicine. *Nat Rev Genet.*, 2016; 17: 507–522.
8. Hamburg MA, Collins FS. The path to personalized medicine. *N Engl J Med.*, 2010; 363: 301–304.
9. National Research Council. Toward Precision Medicine: Building a Knowledge Network for Biomedical Research and a New Taxonomy of Disease. National Academies Press, Washington, DC, 2011.