

DRAWINGS

FIG. 1

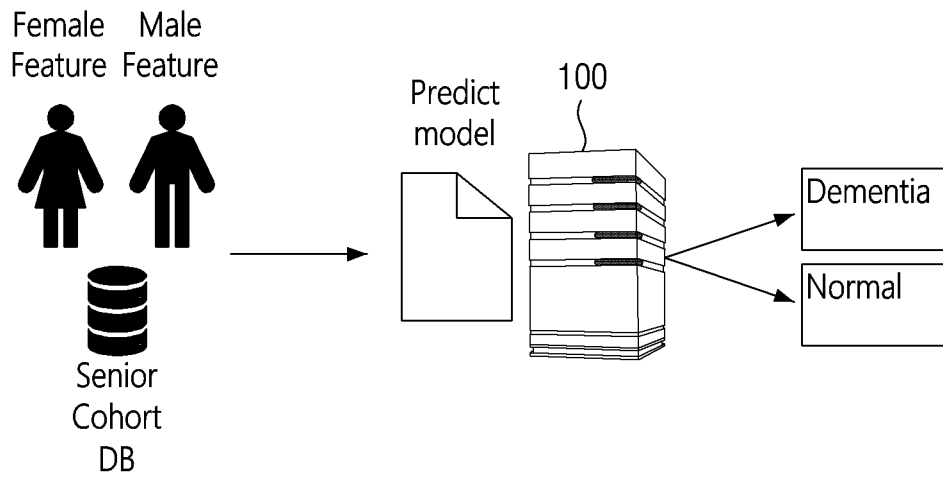


FIG. 2

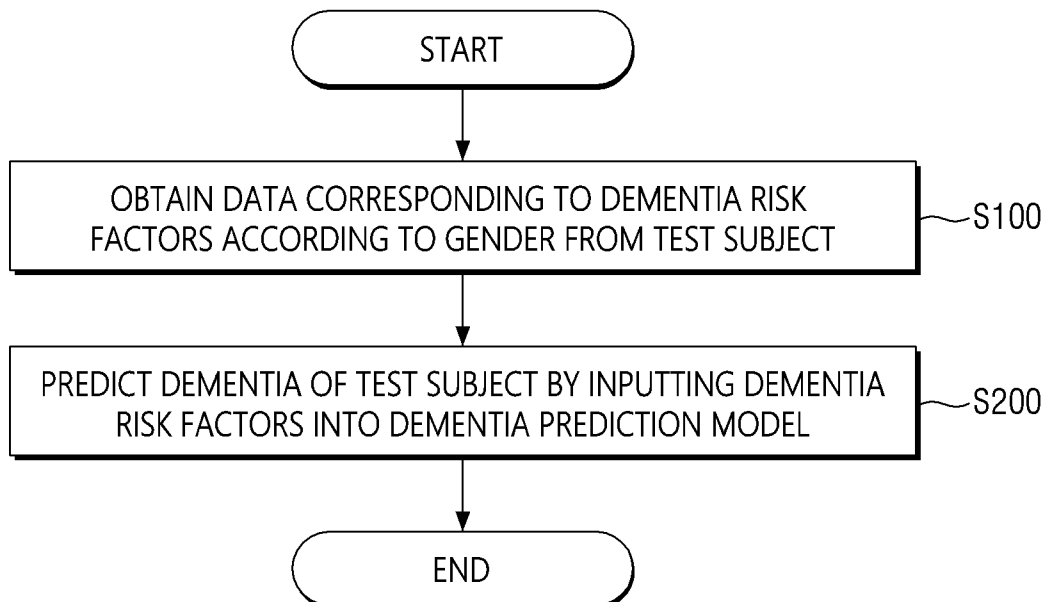


FIG. 3

1

Participant insurance eligibility DB (PIE-DB)	Demographic information (sex, age, area of residence) Death related information (date of death, cause of death) Types of health insurance (health insurance subscribers/medical benefits) Socio-economic level and other information (income quintile, disability registration information)
Medical treatment DB (MT-DB)	Medical institution information Medical care benefit costs Information on medical subjects and medical diseases Details of medical examination, treatment, surgery and other acts, treatment materials, etc. Detailed diseases history In-house/outpatient prescription drug prescription
General health examination DB (GHE-DB)	Major test results such as body measurement, blood test Results of interview about history, lifestyle Balance, bone density test, depression, cognitive function test result
Medical Care Institution DB (MCI-DB)	Medical utilization, medical institution type and establishment division, medical institution, local information Information on the number of beds, doctors, equipment, etc.
Long-term Care Insurance DB (LCI-DB)	Long-term care application and judgment result Doctor's note Billing statement Basic information on long-term care facilities

FIG. 4

2

Participant's Insurance Eligibility (PIE-DB)	(1) Sex, (2) Age, (3) Income quintile...
Medical Treatments (MT-DB)	Personal disease history diagnosis by every year
General Health Examinations (GHE-DB)	(1) Height, (2) Weight, (3) Body mass index, (4) Waist, (5) Blood pressure highest, (6) Blood pressure lowest, (7) Blood sugar before meals, (8) Total cholesterol, (9) Hemoglobin, (10) Urine protein, (11) Serum GOT, (12) Serum GPT, (13) Gamma GTP, (14) History of personal illness: Stroke, Heart disease, High blood pressure, Diabetes, Hyperlipidemia, Phthisis, Cancer, (15) History of family illness: Stroke, Heart disease, High blood pressure, Diabetes, cancer...

FIG. 5

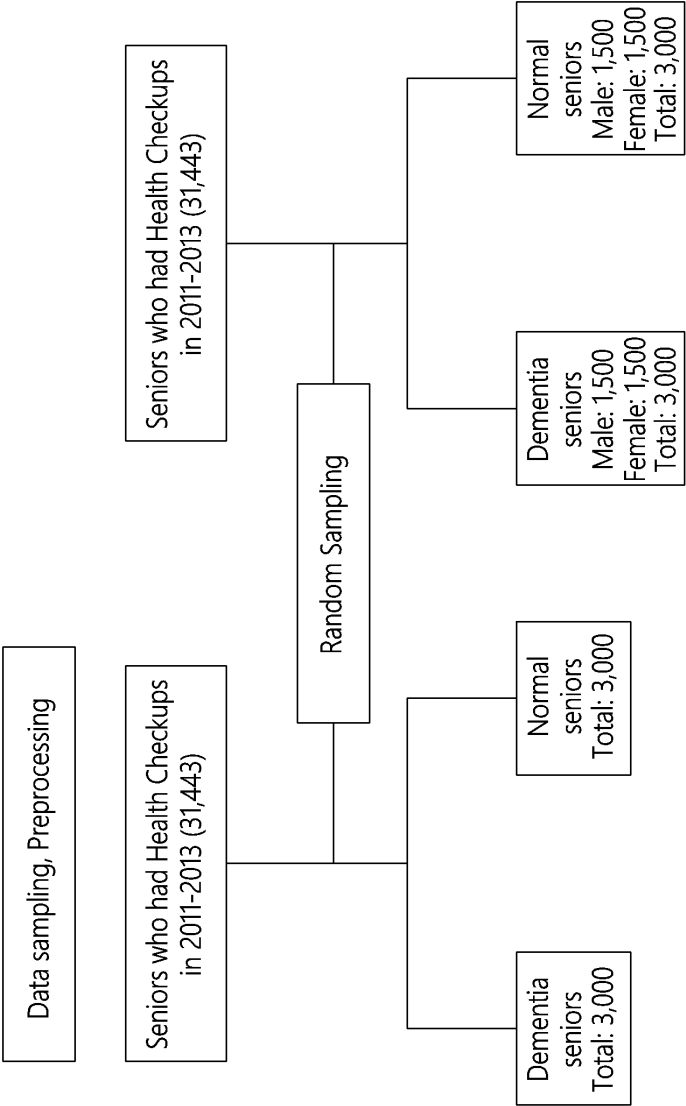


FIG. 6

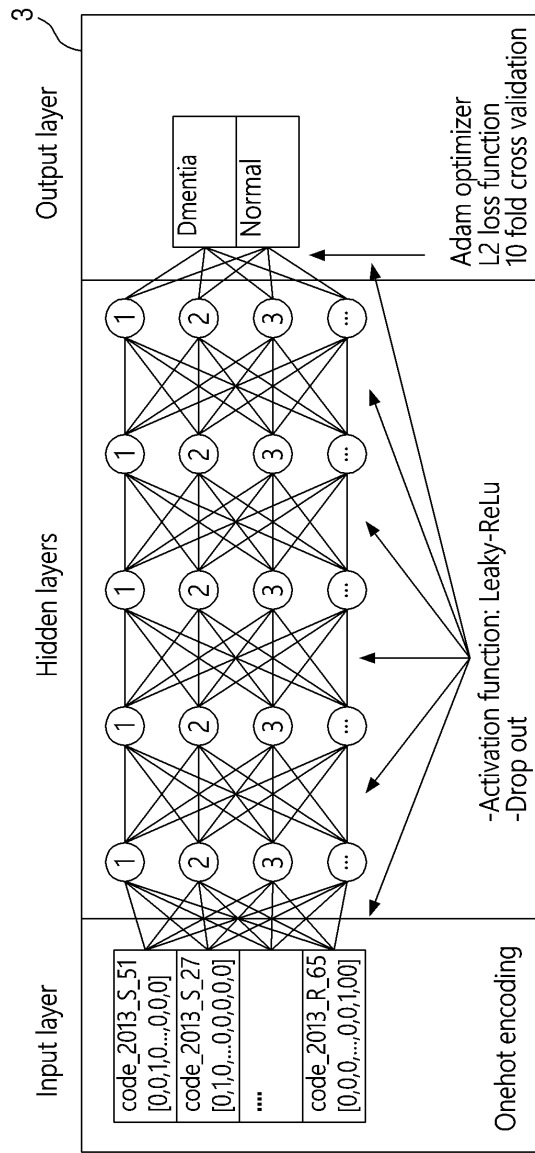


FIG. 7

Results

DEMENTIA PREDICTION MODEL	MLP			SVM			CNN		
	Precision(%)	Recall(%)	Fscore(%)	Precision(%)	Recall(%)	Fscore(%)	Precision(%)	Recall(%)	Fscore(%)
MEN	75.3	81.5	78.3	81.7	66.4	73.3	68.6	62.4	65.4
WOMEN	71.5	74.2	72.8	70.7	58.6	65.3	55.8	75.3	64.1

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FIG. 8

List of Men's Dementia Risk Factors

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Top 50 Men's dementia risk factors									
1	Parkinson's disease	11	Glomerular disorders in diseases classified elsewhere	21	Acute and transient psychotic disorders	31	Mental and behavioural disorders due to use of alcohol	41	Diseases of thymus
2	Other mental disorders due to brain damage and dysfunction and to physical disease	12	Enlarged lymph nodes	22	Parkinsonism in diseases classified elsewhere	32	Hypofunction and other disorders of pituitary gland	42	Other disorders of adrenal gland
3	Paraplegia and tetraplegia	13	Other mental disorders due to brain damage and dysfunction and to physical disease	23	Other degenerative diseases of nervous system NEC	33	Parkinsonism in diseases classified elsewhere	43	Vascular syndromes of brain in cerebrovascular diseases
4	Vitamin D deficiency	14	Bipolar affective disorder	24	Hypertensive renal disease	34	Hydrocephalus	44	Other disorders of male genital organs
5	Schizophrenia	15	Unspecified nonorganic psychosis	25	Other symptoms and signs involving cognitive functions and awareness	35	Sequelae of cerebrovascular disease	45	Other disorders of brain
6	Eating disorders	16	Paraplegia and tetraplegia	26	Unspecified nonorganic psychosis	35	Other disorders of pancreatic internal secretion	46	Cerebrovascular disorders in diseases classified elsewhere
7	Other disorders of nervous system, NEC	17	Unspecified severe protein-energy malnutrition	27	Other disorders of thyroid	37	Malnutrition-related diabetes mellitus	47	Stroke, not specified as haemorrhage or infarction
8	Chronic kidney disease	18	Calculus of lower urinary tract	28	Epilepsy	38	Symptoms and signs involving appearance and behaviour	48	Hemiplegia
9	Acute nephritic syndrome	19	Depressive episode	29	Delirium, not induced by alcohol and other psychoactive substances	39	Abnormalities of gait and mobility	49	Somnolence, stupor and coma
10	Status epilepticus	20	Subsequent myocardial infarction	30	Cerebral infarction	40	Secondary parkinsonism	50	Urethral stricture

FIG. 9

List of Men's Dementia Risk Factors

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Top 50 Men's dementia risk factors									
1	Parkinson's disease	11	Glomerular disorders in diseases classified elsewhere	21	Acute and transient psychotic disorders	31	Mental and behavioural disorders due to use of alcohol	41	Diseases of thymus
2	Other mental disorders due to brain damage and dysfunction and to physical disease	12	Enlarged lymph nodes	22	Parkinsonism in diseases classified elsewhere	32	Hypofunction and other disorders of pituitary gland	42	Other disorders of adrenal gland
3	Paraplegia and tetraplegia	13	Other mental disorders due to brain damage and dysfunction and to physical disease	23	Other degenerative diseases of nervous system NEC	33	Parkinsonism in diseases classified elsewhere	43	Vascular syndromes of brain in cerebrovascular diseases
4	Vitamin D deficiency	14	Bipolar affective disorder	24	Hypertensive renal disease	34	Hydrocephalus	44	Other disorders of male genital organs
5	Schizophrenia	15	Unspecified nonorganic psychosis	25	Other symptoms and signs involving cognitive functions and awareness	35	Sequelae of cerebrovascular disease	45	Other disorders of brain
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8	Chronic kidney disease	18	Calculus of lower urinary tract	28	Epilepsy	38	Symptoms and signs involving appearance and behaviour	48	Hemiplegia
9	Acute nephritic syndrome	19	Depressive episode	29	Delirium, not induced by alcohol and other psychoactive substances	39	Abnormalities of gait and mobility	49	Somnolence, stupor and coma
10	Status epilepticus	20	Subsequent myocardial infarction	30	Cerebral infarction	40	Secondary parkinsonism	50	Urethral stricture

FIG. 10

List of Women's Dementia Risk Factors

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Top 50 Women's dementia risk factors									
1	Cerebral infarction	11	Malnutrition-related diabetes mellitus	21	Hypertensive renal disease	31	Hypofunction and other disorders of pituitary gland	41	Disorders of other cranial nerves
2	Other degenerative diseases of nervous system NEC	12	Other disorders of adrenal gland	22	Sequelae of cerebrovascular disease	32	Other symptoms and signs involving cognitive functions and awareness	42	Schizophrenia
3	Paraplegia and tetraplegia	13	Mental and behavioural disorders due to use of alcohol	23	Acute and transient psychotic disorders	33	Secondary parkinsonism	43	Parkinsonism in diseases classified elsewhere
4	Delirium, not induced by alcohol and other psychoactive substances	14	Enlarged lymph nodes	24	Calculus of lower urinary tract	34	Status epilepticus	44	Systemic Inflammatory Response Syndrome
5	Inflammatory disease of uterus, except cervix	15	Bipolar affective disorder	25	Eating disorders	35	Mental and behavioural disorders due to use of alcohol	45	Stroke, not specified as haemorrhage or infarction
6	Unspecified urinary incontinence	16	Vitamin D deficiency	26	Hemiplegia	36	Transient cerebral ischaemic attacks and related syndromes	46	Other disorders of brain
7	Other disorders of pancreatic internal secretion	17	Polyp of female genital tract	27	Glomerular disorders in diseases classified elsewhere	37	Other mental disorders due to brain damage and dysfunction and to physical disease	47	Unspecified nonorganic psychosis
8	Other mental disorders due to brain damage and dysfunction and to physical disease	18	Paraplegia and tetraplegia	28	Other symptoms and signs involving general sensations and perceptions	38	Parkinson's disease	48	Diseases of thymus
9	Vascular syndromes of brain in cerebrovascular diseases	19	Symptoms and signs involving appearance and behaviour	29	Subsequent myocardial infarction	39	Calculus of lower urinary tract	49	Hydrocephalus
10	Depressive episode	20	Epilepsy	30	Abnormalities of gait and mobility	40	Glomerular disorders in diseases classified elsewhere	50	Urethral stricture

FIG. 11

List of Women's Dementia Risk Factors

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Top 50 Women's dementia risk factors									
1	Cerebral infarction	11	Malnutrition-related diabetes mellitus	21	Hypertensive renal disease	31	Hypofunction and other disorders of pituitary gland	41	Disorders of other cranial nerves
2	Other degenerative diseases of nervous system NEC	12	Other disorders of adrenal gland	22	Sequelae of cerebrovascular disease	32	Other symptoms and signs involving cognitive functions and awareness	42	Schizophrenia
3	Paraplegia and tetraplegia	13	Mental and behavioural disorders due to use of alcohol	23	Acute and transient psychotic disorders	33	Secondary parkinsonism	43	Parkinsonism in diseases classified elsewhere
4	Delirium, not induced by alcohol and other psychoactive substances	14	Enlarged lymph nodes	24	Calculus of lower urinary tract	34	Status epilepticus	44	Systemic Inflammatory Response Syndrome
5	Inflammatory disease of uterus, except cervix	15	Bipolar affective disorder	25	Eating disorders	35	Mental and behavioural disorders due to use of alcohol	45	Stroke, not specified as haemorrhage or infarction
6	Unspecified urinary incontinence	16	Vitamin D deficiency	26	Hemiplegia	36	Transient cerebral ischaemic attacks and related syndromes	46	Other disorders of brain
7	Other disorders of pancreatic internal secretion	17	Polyp of female genital tract	27	Glomerular disorders in diseases classified elsewhere	37	Other mental disorders due to brain damage and dysfunction and to physical disease	47	Unspecified nonorganic psychosis
8	Other mental disorders due to brain damage and dysfunction and to physical disease	18	Paraplegia and tetraplegia	28	Other symptoms and signs involving general sensations and perceptions	38	Parkinson's disease	48	Diseases of thymus
9	Vascular syndromes of brain in cerebrovascular diseases	19	Symptoms and signs involving appearance and behaviour	29	Subsequent myocardial infarction	39	Calculus of lower urinary tract	49	Hydrocephalus
10	Depressive episode	20	Epilepsy	30	Abnormalities of gait and mobility	40	Glomerular disorders in diseases classified elsewhere	50	Urethral stricture

FIG. 12

