

# Package: pda (via r-universe)

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**Type** Package

**Title** Privacy-Preserving Distributed Algorithms

**Version** 1.3.0

**Date** 2025-11-11

**Description** A collection of privacy-preserving distributed algorithms (PDAs) for conducting federated statistical learning across multiple data sites. The PDA framework includes models for various tasks such as regression, trial emulation, causal inference, design-specific analysis, and clustering. The PDA algorithms run on a lead site and only require summary statistics from collaborating sites, with one or few iterations. The package can be used together with the online data transfer system (<https://pda-ota.pdamethods.org/>) for safe and convenient collaboration. For more information, please visit our software websites: <https://github.com/Penncil/pda>, and <https://pdamethods.org/>.

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**License** Apache License 2.0

**Suggests** lme4

**Depends** R (>= 4.1.0)

**Imports** Rcpp (>= 0.12.19), stats, httr, rvest, jsonlite, data.table, cobalt, EmpiricalCalibration, survival, minqa, glmnet, MASS, numDeriv, metafor, Matrix, ordinal, plyr, tidyr, tibble, dplyr, geex, data.tree

**LinkingTo** Rcpp, RcppArmadillo, RcppEigen

**RoxygenNote** 7.3.3

**Encoding** UTF-8

**LazyData** true

**NeedsCompilation** yes

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ADAP\_data

*ADAP simulated data*

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### Description

A simulated data set for ADAP demonstration

### Usage

ADAP\_data

**Format**

A list containing the following elements:

**sites** site id, 300 'site1', 300 'site2', 300 'site3'

**status** binary outcome of length 900

**x** 900 by 49 matrix generated by standard normal distribution, representing the covariates

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COLA_covid	<i>COLA simulated data</i>
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**Description**

A simulated COVID-19 data set for Collaborative One-shot and Lossless Algorithms of generalized linear models (COLA-GLM)

**Usage**

COLA\_covid

**Format**

A data frame with 1500 rows and 6 variables:

**site** site, 600 'site1', 500 'site2', 400 'site3'

**age** binary age

**sex** binary sex

**medical\_condition** binary medical condition

**status** binary outcome, COVID-19 status. This is the binary outcome for COLA logistic regression

**visits** poisson outcome, number of visits. This is the count outcome for COLA Poisson regression

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covid	<i>COVID-19 LOS and mortality data</i>
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**Description**

A simulated data set of hospitalization Length of Stay (LOS) and mortality from 6 sites

**Usage**

covid

**Format**

A data frame with 2100 rows and 6 variables:

**site** site id, 600 'site1', 500 'site2', 400 'site3', 300 'site4', 200 'site5', 100 'site6'

**age** continuous age in year, min 3 max 97

**sex** 2 categories, '1' for male and '0' for female

**lab** lab test results, continuous value ranging from 2.3 to 97.4

**los** LOS in days, ranging from 1 to 29

**death** mortality status, '1' for death and '0' for alive.

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cs

*CrabSatellites data*

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**Description**

A data set modified from the CrabSatellites data in countreg package (see demo(ODAH)).

**Usage**

cs

**Format**

A data frame containing 173 observations on 4 variables.

**site** Simulated site id, 85 'site1' and 88 'site2'.

**satellites** Number of satellites. Treated as (zero-inflated) count outcome in ODAH

**width** Carapace width (cm).

**weight** Weight (kg).

**Source**

<https://rdr.io/rforge/countreg/man/CrabSatellites.html>

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getCloudConfig	<i>gather cloud settings into a list</i>
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**Description**

gather cloud settings into a list

**Usage**

```
getCloudConfig(site_id,dir=NULL,uri=NULL,secret=NULL,silent_message=T)
```

**Arguments**

site_id	site identifier
dir	shared directory path if flat files
uri	web uri if web service
secret	web token if web service
silent_message	logical, if the message will be muted

**Value**

A list of cloud parameters: site\_id, secret and uri

**See Also**

pda

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LATTE_ADRD	<i>LATTE simulated data</i>
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**Description**

A simulated ADRD data set for Lossless Oneshot Algorithm for Target Trial Emulation (LATTE)

**Usage**

```
LATTE_ADRD
```

**Format**

A data frame with 1224 rows and 326 variables:

**ID** Unique patient identifier

**Stroke...Transient.Ischemic.Attack** History of Stroke or Transient Ischemic Attack, binary indicator

**Acquired.Hypothyroidism** History of Acquired Hypothyroidism, binary indicator

**Fibromyalgia..Chronic.Pain.and.Fatigue** History of Fibromyalgia, Chronic Pain and Fatigue, binary indicator

**RA.OA..Rheumatoid.Arthritis..Osteoarthritis.** History of RA/OA (Rheumatoid Arthritis / Osteoarthritis), binary indicator

**Hypertension** History of Hypertension, binary indicator

**Anxiety.Disorders** History of Anxiety Disorders, binary indicator

**Chronic.Obstructive.Pulmonary.Disease.and.Bronchiectasis** History of Chronic Obstructive Pulmonary Disease (COPD) and Bronchiectasis, binary indicator

**Asthma** History of Asthma, binary indicator

**Traumatic.Brain.Injury.and.Nonpsychotic.Mental.Disorders.due.to.Brain.Damage** History of Traumatic Brain Injury and Nonpsychotic Mental Disorders due to Brain Damage, binary indicator

**Sleep.disorders** History of Sleep disorders, binary indicator

**ADHD..Conduct.Disorders..and.Hyperkinetic.Syndrom** History of ADHD, Conduct Disorders, and Hyperkinetic Syndrome, binary indicator

**Cataract** History of Cataract, binary indicator

**Migraine.and.Chronic.Headache** History of Migraine and Chronic Headache, binary indicator

**Depressive.Disorders** History of Depressive Disorders, binary indicator

**Hyperlipidemia** History of Hyperlipidemia, binary indicator

**Sensory...Deafness.and.Hearing.Impairment** History of Sensory Deafness and Hearing Impairment, binary indicator

**Female...Male.Breast.Cancer** History of Female/Male Breast Cancer, binary indicator

**Personality.Disorders** History of Personality Disorders, binary indicator

**Anemia** History of Anemia, binary indicator

**Chronic.Kidney.Disease** History of Chronic Kidney Disease, binary indicator

**Schizophrenia.and.Other.Psychotic.Disorders** History of Schizophrenia and Other Psychotic Disorders, binary indicator

**Glaucoma** History of Glaucoma, binary indicator

**Peripheral.Vascular.Disease..PVD.** History of Peripheral Vascular Disease (PVD), binary indicator

**Heart.Failure** History of Heart Failure, binary indicator

**Pressure.and.Chronic.Ulcers** History of Pressure and Chronic Ulcers, binary indicator

**Obesity** History of Obesity, binary indicator

**Diabetes** History of Diabetes, binary indicator

**Mobility.Impairments** History of Mobility Impairments, binary indicator

**Benign.Prostatic.Hyperplasia** History of Benign Prostatic Hyperplasia, binary indicator

**Drug.Use.Disorders** History of Drug Use Disorders, binary indicator

**Alcohol.Use.Disorders** History of Alcohol Use Disorders, binary indicator

**Post.Traumatic.Stress.Disorder..PTSD.** History of Post Traumatic Stress Disorder (PTSD), binary indicator

**Atrial.Fibrillation** History of Atrial Fibrillation, binary indicator

**Tobacco.Use** History of Tobacco Use, binary indicator

**Ischemic.Heart.Disease** History of Ischemic Heart Disease, binary indicator

**Liver.Disease..Cirrhosis.and.Other.Liver.Conditions..except.Viral.Hepatitis.** History of Liver Disease (Cirrhosis and Other Liver Conditions except Viral Hepatitis), binary indicator

**Sensory...Blindness.and.Visual.Impairment** History of Sensory Blindness and Visual Impairment, binary indicator

**Bipolar.Disorder** History of Bipolar Disorder, binary indicator

**Depression** History of Depression, binary indicator

**Prostate.Cancer** History of Prostate Cancer, binary indicator

**Acute.Myocardial.Infarction** History of Acute Myocardial Infarction, binary indicator

**Hip.Pelvic.Fracture** History of Hip/Pelvic Fracture, binary indicator

**Other.Developmental.Delays** History of Other Developmental Delays, binary indicator

**Viral.Hepatitis..General.** History of Viral Hepatitis (General), binary indicator

**Sickle.Cell.Disease** History of Sickle Cell Disease, binary indicator

**Multiple.Sclerosis.and.Transverse.Myelitis** History of Multiple Sclerosis and Transverse Myelitis, binary indicator

**Leukemias.and.Lymphomas** History of Leukemias and Lymphomas, binary indicator

**Opioid.Use.Disorder** History of Opioid Use Disorder, binary indicator

**Colorectal.Cancer** History of Colorectal Cancer, binary indicator

**Epilepsy** History of Epilepsy, binary indicator

**Osteoporosis** History of Osteoporosis, binary indicator

**Intellectual.Disabilities.and.Related.Conditions** History of Intellectual Disabilities and Related Conditions, binary indicator

**Spinal.Cord.Injury** History of Spinal Cord Injury, binary indicator

**Endometrial.Cancer** History of Endometrial Cancer, binary indicator

**Spina.Bifida.and.Other.Congenital.Anomalies.of.the.Nervous.System** History of Spina Bifida and Other Congenital Anomalies of the Nervous System, binary indicator

**Learning.Disabilities** History of Learning Disabilities, binary indicator

**Periodontitis** History of Periodontitis, binary indicator

**Lung.Cancer** History of Lung Cancer, binary indicator

**Cystic.Fibrosis.and.Other.Metabolic.Developmental.Disorders** History of Cystic Fibrosis and Other Metabolic Developmental Disorders, binary indicator

**Cerebral.Palsy** History of Cerebral Palsy, binary indicator

**Human.Immunodeficiency.Virus.and.or.Acquired.Immunodeficiency.Syndrome..HIV.AIDS.** History of Human Immunodeficiency Virus and/or Acquired Immunodeficiency Syndrome (HIV/AIDS), binary indicator

**Menopause** History of Menopause, binary indicator

**Muscular.Dystrophy** History of Muscular Dystrophy, binary indicator

**Autism.Spectrum.Disorders** History of Autism Spectrum Disorders, binary indicator

**atorvastatin** History of atorvastatin use, binary indicator

**hydrochlorothiazide** History of hydrochlorothiazide use, binary indicator

**amlodipine** History of amlodipine use, binary indicator

**aspirin** History of aspirin use, binary indicator

**metoprolol** History of metoprolol use, binary indicator

**levothyroxine** History of levothyroxine use, binary indicator

**metformin** History of metformin use, binary indicator

**lisinopril** History of lisinopril use, binary indicator

**simvastatin** History of simvastatin use, binary indicator

**sodium.chloride** History of sodium chloride use, binary indicator

**omeprazole** History of omeprazole use, binary indicator

**albuterol** History of albuterol use, binary indicator

**potassium.chloride** History of potassium chloride use, binary indicator

**sertraline** History of sertraline use, binary indicator

**lidocaine** History of lidocaine use, binary indicator

**furosemide** History of furosemide use, binary indicator

**losartan** History of losartan use, binary indicator

**donepezil** History of donepezil use, binary indicator

**cholecalciferol** History of cholecalciferol use, binary indicator

**ondansetron** History of ondansetron use, binary indicator

**oxycodone** History of oxycodone use, binary indicator

**lorazepam** History of lorazepam use, binary indicator

**glucose.oxidase** History of glucose oxidase use, binary indicator

**prednisone** History of prednisone use, binary indicator

**fluticasone** History of fluticasone use, binary indicator

**gabapentin** History of gabapentin use, binary indicator

**rosuvastatin** History of rosuvastatin use, binary indicator

**tamsulosin** History of tamsulosin use, binary indicator

**fentanyl** History of fentanyl use, binary indicator

**carbidopa** History of carbidopa use, binary indicator  
**pantoprazole** History of pantoprazole use, binary indicator  
**escitalopram** History of escitalopram use, binary indicator  
**insulin.aspart..human** History of insulin aspart (human) use, binary indicator  
**clonazepam** History of clonazepam use, binary indicator  
**carvedilol** History of carvedilol use, binary indicator  
**heparin** History of heparin use, binary indicator  
**bupropion** History of bupropion use, binary indicator  
**polyethylene.glycol.3350** History of polyethylene glycol 3350 use, binary indicator  
**pravastatin** History of pravastatin use, binary indicator  
**docusate** History of docusate use, binary indicator  
**vitamin.B12** History of vitamin B12 use, binary indicator  
**clopidogrel** History of clopidogrel use, binary indicator  
**atenolol** History of atenolol use, binary indicator  
**glipizide** History of glipizide use, binary indicator  
**ascorbic.acid** History of ascorbic acid use, binary indicator  
**glucose** History of glucose use, binary indicator  
**insulin.glargine** History of insulin glargine use, binary indicator  
**zolpidem** History of zolpidem use, binary indicator  
**warfarin** History of warfarin use, binary indicator  
**azithromycin** History of azithromycin use, binary indicator  
**trazodone** History of trazodone use, binary indicator  
**esomeprazole** History of esomeprazole use, binary indicator  
**sennosides..USP** History of sennosides (USP) use, binary indicator  
**propofol** History of propofol use, binary indicator  
**iopamidol** History of iopamidol use, binary indicator  
**diltiazem** History of diltiazem use, binary indicator  
**ibuprofen** History of ibuprofen use, binary indicator  
**dexamethasone** History of dexamethasone use, binary indicator  
**tramadol** History of tramadol use, binary indicator  
**amoxicillin** History of amoxicillin use, binary indicator  
**midazolam** History of midazolam use, binary indicator  
**lansoprazole** History of lansoprazole use, binary indicator  
**citalopram** History of citalopram use, binary indicator  
**valsartan** History of valsartan use, binary indicator  
**ciprofloxacin** History of ciprofloxacin use, binary indicator  
**famotidine** History of famotidine use, binary indicator

**calcium.carbonate** History of calcium carbonate use, binary indicator  
**finasteride** History of finasteride use, binary indicator  
**levofloxacin** History of levofloxacin use, binary indicator  
**sulfamethoxazole** History of sulfamethoxazole use, binary indicator  
**duloxetine** History of duloxetine use, binary indicator  
**alprazolam** History of alprazolam use, binary indicator  
**naproxen** History of naproxen use, binary indicator  
**levetiracetam** History of levetiracetam use, binary indicator  
**ranitidine** History of ranitidine use, binary indicator  
**triamcinolone** History of triamcinolone use, binary indicator  
**salmeterol** History of salmeterol use, binary indicator  
**folic.acid** History of folic acid use, binary indicator  
**nifedipine** History of nifedipine use, binary indicator  
**ferrous.sulfate** History of ferrous sulfate use, binary indicator  
**morphine** History of morphine use, binary indicator  
**hydralazine** History of hydralazine use, binary indicator  
**montelukast** History of montelukast use, binary indicator  
**magnesium.sulfate** History of magnesium sulfate use, binary indicator  
**methylphenidate** History of methylphenidate use, binary indicator  
**hydrocortisone** History of hydrocortisone use, binary indicator  
**latanoprost** History of latanoprost use, binary indicator  
**quetiapine** History of quetiapine use, binary indicator  
**metronidazole** History of metronidazole use, binary indicator  
**diphenhydramine** History of diphenhydramine use, binary indicator  
**memantine** History of memantine use, binary indicator  
**methylprednisolone** History of methylprednisolone use, binary indicator  
**doxycycline** History of doxycycline use, binary indicator  
**fluoxetine** History of fluoxetine use, binary indicator  
**paroxetine** History of paroxetine use, binary indicator  
**gadobenate** History of gadobenate use, binary indicator  
**propranolol** History of propranolol use, binary indicator  
**ramipril** History of ramipril use, binary indicator  
**ezetimibe** History of ezetimibe use, binary indicator  
**allopurinol** History of allopurinol use, binary indicator  
**enoxaparin** History of enoxaparin use, binary indicator  
**apixaban** Binary indicator for history of apixaban  
**sildenafil** Binary indicator for history of sildenafil

**oxybutynin** Binary indicator for history of oxybutynin  
**insulin.lispro** Binary indicator for history of insulin lispro  
**melatonin** Binary indicator for history of melatonin  
**tadalafil** Binary indicator for history of tadalafil  
**hydromorphone** Binary indicator for history of hydromorphone  
**ipratropium** Binary indicator for history of ipratropium  
**cephalexin** Binary indicator for history of cephalexin  
**lovastatin** Binary indicator for history of lovastatin  
**mirtazapine** Binary indicator for history of mirtazapine  
**venlafaxine** Binary indicator for history of venlafaxine  
**fenofibrate** Binary indicator for history of fenofibrate  
**guaifenesin** Binary indicator for history of guaifenesin  
**estradiol** Binary indicator for history of estradiol  
**nitroglycerin** Binary indicator for history of nitroglycerin  
**pregabalin** Binary indicator for history of pregabalin  
**lamotrigine** Binary indicator for history of lamotrigine  
**enalapril** Binary indicator for history of enalapril  
**ergocalciferol** Binary indicator for history of ergocalciferol  
**ketoconazole** Binary indicator for history of ketoconazole  
**spironolactone** Binary indicator for history of spironolactone  
**cyclobenzaprine** Binary indicator for history of cyclobenzaprine  
**meloxicam** Binary indicator for history of meloxicam  
**cetirizine** Binary indicator for history of cetirizine  
**alendronate** Binary indicator for history of alendronate  
**nortriptyline** Binary indicator for history of nortriptyline  
**bisacodyl** Binary indicator for history of bisacodyl  
**sitagliptin** Binary indicator for history of sitagliptin  
**salmon.oil** Binary indicator for history of salmon oil  
**olmesartan** Binary indicator for history of olmesartan  
**timolol** Binary indicator for history of timolol  
**nitrofurantoin** Binary indicator for history of nitrofurantoin  
**celecoxib** Binary indicator for history of celecoxib  
**glimepiride** Binary indicator for history of glimepiride  
**iohexol** Binary indicator for history of iohexol  
**clonidine** Binary indicator for history of clonidine  
**valacyclovir** Binary indicator for history of valacyclovir  
**ropinirole** Binary indicator for history of ropinirole

**bupivacaine** Binary indicator for history of bupivacaine  
**benzonatate** Binary indicator for history of benzonatate  
**carbamazepine** Binary indicator for history of carbamazepine  
**meclizine** Binary indicator for history of meclizine  
**azelastine** Binary indicator for history of azelastine  
**diclofenac** Binary indicator for history of diclofenac  
**clobetasol** Binary indicator for history of clobetasol  
**ketorolac** Binary indicator for history of ketorolac  
**amphetamine** Binary indicator for history of amphetamine  
**budesonide** Binary indicator for history of budesonide  
**diazepam** Binary indicator for history of diazepam  
**repaglinide** Binary indicator for history of repaglinide  
**omega.3.acid.ethyl.esters..USP.** Binary indicator for history of omega-3-acid ethyl esters (USP)  
**methadone** Binary indicator for history of methadone  
**clindamycin** Binary indicator for history of clindamycin  
**rivaroxaban** Binary indicator for history of rivaroxaban  
**vitamin.E** Binary indicator for history of vitamin E  
**valproate** Binary indicator for history of valproate  
**tiotropium** Binary indicator for history of tiotropium  
**temazepam** Binary indicator for history of temazepam  
**chlorhexidine** Binary indicator for history of chlorhexidine  
**hydroxychloroquine** Binary indicator for history of hydroxychloroquine  
**nystatin** Binary indicator for history of nystatin  
**olanzapine** Binary indicator for history of olanzapine  
**nicotine** Binary indicator for history of nicotine  
**mometasone** Binary indicator for history of mometasone  
**prednisolone** Binary indicator for history of prednisolone  
**estrogens..conjugated..USP.** Binary indicator for history of conjugated estrogens (USP)  
**mupirocin** Binary indicator for history of mupirocin  
**loratadine** Binary indicator for history of loratadine  
**fexofenadine** Binary indicator for history of fexofenadine  
**solifenacin** Binary indicator for history of solifenacin  
**irbesartan** Binary indicator for history of irbesartan  
**ephedrine** Binary indicator for history of ephedrine  
**isosorbide** Binary indicator for history of isosorbide  
**gadoterate.meglumine** Binary indicator for history of gadoterate meglumine  
**ubidecarenone** Binary indicator for history of ubidecarenone

**verapamil** Binary indicator for history of verapamil  
**promethazine** Binary indicator for history of promethazine  
**doxazosin** Binary indicator for history of doxazosin  
**fluconazole** Binary indicator for history of fluconazole  
**haloperidol** Binary indicator for history of haloperidol  
**rivastigmine** Binary indicator for history of rivastigmine  
**labetalol** Binary indicator for history of labetalol  
**eszopiclone** Binary indicator for history of eszopiclone  
**insulin.detemir** Binary indicator for history of insulin detemir  
**aripiprazole** Binary indicator for history of aripiprazole  
**vancomycin** Binary indicator for history of vancomycin  
**thiamine** Binary indicator for history of thiamine  
**epinephrine** Binary indicator for history of epinephrine  
**amitriptyline** Binary indicator for history of amitriptyline  
**tolterodine** Binary indicator for history of tolterodine  
**cefazolin** Binary indicator for history of cefazolin  
**lisdexamfetamine** Binary indicator for history of lisdexamfetamine  
**risperidone** Binary indicator for history of risperidone  
**mirabegron** Binary indicator for history of mirabegron  
**magnesium.oxide** Binary indicator for history of magnesium oxide  
**niacin** Binary indicator for history of niacin  
**pramipexole** Binary indicator for history of pramipexole  
**zoledronic.acid** Binary indicator for history of zoledronic acid  
**sex** Binary sex  
**age** Age (continuous)  
**race** Race  
**days** Time from index to event (continuous)  
**index\_date** Index date of diagnosis  
**treatment** Binary treatment indicator  
**outcome\_AD\_value** Outcome binary indicator: AD  
**outcome\_AD\_time** Outcome time: AD  
**outcome\_ADRD\_value** Outcome binary indicator: ADRD  
**outcome\_ADRD\_time** Outcome time: ADRD  
**outcome\_acute\_conjunctivitis\_value** Outcome binary indicator: acute conjunctivitis  
**outcome\_acute\_conjunctivitis\_time** Outcome time: acute conjunctivitis  
**outcome\_acute\_tonsillitis\_value** Outcome binary indicator: acute tonsillitis  
**outcome\_acute\_tonsillitis\_time** Outcome time: acute tonsillitis

**outcome\_adhesive\_capsulitis\_of\_shoulder\_value** Outcome binary indicator: adhesive capsulitis of shoulder

**outcome\_adhesive\_capsulitis\_of\_shoulder\_time** Outcome time: adhesive capsulitis of shoulder

**outcome\_allergic\_rhinitis\_value** Outcome binary indicator: allergic rhinitis

**outcome\_allergic\_rhinitis\_time** Outcome time: allergic rhinitis

**outcome\_blepharitis\_value** Outcome binary indicator: blepharitis

**outcome\_blepharitis\_time** Outcome time: blepharitis

**outcome\_carpal\_tunnel\_syndrome\_value** Outcome binary indicator: carpal tunnel syndrome

**outcome\_carpal\_tunnel\_syndrome\_time** Outcome time: carpal tunnel syndrome

**outcome\_chalazion\_value** Outcome binary indicator: chalazion

**outcome\_chalazion\_time** Outcome time: chalazion

**outcome\_contact\_dermatitis\_value** Outcome binary indicator: contact dermatitis

**outcome\_contact\_dermatitis\_time** Outcome time: contact dermatitis

**outcome\_dental\_caries\_value** Outcome binary indicator: dental caries

**outcome\_dental\_caries\_time** Outcome time: dental caries

**outcome\_deviated\_nasal\_septum\_value** Outcome binary indicator: deviated nasal septum

**outcome\_deviated\_nasal\_septum\_time** Outcome time: deviated nasal septum

**outcome\_foreign\_body\_in\_ear\_value** Outcome binary indicator: foreign body in ear

**outcome\_foreign\_body\_in\_ear\_time** Outcome time: foreign body in ear

**outcome\_gout\_value** Outcome binary indicator: gout

**outcome\_gout\_time** Outcome time: gout

**outcome\_hemorrhoids\_value** Outcome binary indicator: hemorrhoids

**outcome\_hemorrhoids\_time** Outcome time: hemorrhoids

**outcome\_impacted\_cerumen\_value** Outcome binary indicator: impacted cerumen

**outcome\_impacted\_cerumen\_time** Outcome time: impacted cerumen

**outcome\_influenza\_value** Outcome binary indicator: influenza

**outcome\_influenza\_time** Outcome time: influenza

**outcome\_ingrowing\_nail\_value** Outcome binary indicator: ingrowing nail

**outcome\_ingrowing\_nail\_time** Outcome time: ingrowing nail

**outcome\_low\_back\_pain\_value** Outcome binary indicator: low back pain

**outcome\_low\_back\_pain\_time** Outcome time: low back pain

**outcome\_menieres\_disease\_value** Outcome binary indicator: menieres disease

**outcome\_menieres\_disease\_time** Outcome time: menieres disease

**outcome\_osteoarthritis\_of\_knee\_value** Outcome binary indicator: osteoarthritis of knee

**outcome\_osteoarthritis\_of\_knee\_time** Outcome time: osteoarthritis of knee

**outcome\_osteoporosis\_value** Outcome binary indicator: osteoporosis

**outcome\_osteoporosis\_time** Outcome time: osteoporosis

**outcome\_foot\_drop\_value** Outcome binary indicator: foot drop  
**outcome\_foot\_drop\_time** Outcome time: foot drop  
**outcome\_hearing\_problem\_value** Outcome binary indicator: hearing problem  
**outcome\_hearing\_problem\_time** Outcome time: hearing problem  
**outcome\_intra\_abdominal\_and\_pelvic\_swelling\_mass\_and\_lump\_value** Outcome binary indicator: intra abdominal and pelvic swelling mass and lump  
**outcome\_intra\_abdominal\_and\_pelvic\_swelling\_mass\_and\_lump\_time** Outcome time: intra abdominal and pelvic swelling mass and lump  
**outcome\_irritability\_and\_anger\_value** Outcome binary indicator: irritability and anger  
**outcome\_irritability\_and\_anger\_time** Outcome time: irritability and anger  
**outcome\_wristdrop\_value** Outcome binary indicator: wristdrop  
**outcome\_wristdrop\_time** Outcome time: wristdrop  
**site** Study site identifier

---

 long\_covid

*DisC2o simulated data*


---

### Description

A simulated long-covid data set for Distributed causal inference with covariates shift (DisC2o). This only contains 5 covariates and more noisy covariates can be added when running demo example.

### Usage

```
long_covid
```

### Format

A data frame with 900 rows and 53 variables:

**PASC\_features** number of Post Acute Sequelae of COVID (PASC, or long covid) features

**covid\_vaccination** treatment of covid vaccination, 1=vaccinated

**site** site id, 300 participants each for 'site1', 'site2', and 'site3'

**X1** a binary covariate

**X2** a binary covariate

**X3** a continuous covariate

**X4** a continuous covariate

**X5** a continuous covariate

---

LOS *Length of Stay data*

---

**Description**

A simulated data set of hospitalization Length of Stay (LOS) from 3 sites

**Usage**

LOS

**Format**

A data frame with 1000 rows and 5 variables:

**site** site id, 500 'site1', 400 'site2' and 100 'site3'

**age** 3 categories, 'young', 'middle', and 'old'

**sex** 2 categories, 'M' for male and 'F' for female

**lab** lab test results, continuous value ranging from 0 to 100

**los** LOS in days, ranging from 1 to 28. Treated as continuous outcome in DLM

---

lung2 *Lung cancer survival time data*

---

**Description**

A data set modified from the lung data in survival package (see demo(ODAC)).

**Usage**

lung2

**Format**

A data frame with 228 rows and 5 variables:

**site** simulated site id, 86 'site1', 83 'site2' and 59 'site3'

**time** survival time in days

**status** censoring status 0=censored, 1=dead

**age** age in years

**sex** 1 for female and 0 for male

**Source**

<https://CRAN.R-project.org/package=survival>

---

nominal\_data\_hetero      *ODACATH simulated data with nominal outcome*

---

**Description**

A simulated data set for ODACATH demonstration

**Usage**

nominal\_data\_hetero

**Format**

A list containing the following elements:

**id.site** site id, 100 'site1', 100 'site2', 100 'site3'

**y** nominal outcome taking values 1,2,3

**X1\_cont** a continuous covariate

**X2\_bin** a binary covariate

---

ODACAT\_nominal      *ODACAT simulated data with nominal outcome*

---

**Description**

A simulated data set for ODACAT demonstration

**Usage**

ODACAT\_nominal

**Format**

A list containing the following elements:

**id.site** site id, 100 'site1', 100 'site2', 100 'site3'

**outcome** nominal outcome taking values 1,2,3

**X1** a continuous covariate

**X2** a binary covariate

**X3** a binary covariate

---

ODACAT_ordinal	<i>ODACAT simulated data with ordinal outcome</i>
----------------	---

---

**Description**

A simulated data set for ODACAT demonstration

**Usage**

ODACAT\_ordinal

**Format**

A data frame with 300 rows and 5 variables:

**id.site** site id, 105 'site1', 105 'site2', 90 'site3'

**outcome** 3-category outcome, possible values are 1,2,3. Category 3 will be used as reference

**X1** the first covariate, continuous

**X2** the second covariate, binary

**X3** the third covariate, binary

---

odach_cc	<i>ODACH_CC simulated data</i>
----------	--------------------------------

---

**Description**

A simulated data set for ODACH with case-cohort design demonstration

**Usage**

odach\_cc

**Format**

A data frame with 413 rows and 8 variables:

**site** site id, 187 'site1', 133 'site2', 93 'site3'. The full\_cohort\_size are 800, 600 and 400 respectively

**subcohort** 1=subcohort, e.g. uniformly subsampled from full\_cohort\_size, 0=case

**time** survival time

**status** censoring status 0=censored, 1=dead

**X1** the first covariate, continuous

**X2** the second covariate, continuous

**Category** the third covariate, categorical

**Group** the fourth covariate, categorical

---

ordinal_data	<i>ODACATH simulated data with ordinal outcome</i>
--------------	--

---

**Description**

A simulated data set for ODACATH demonstration

**Usage**

```
ordinal_data
```

**Format**

A list containing the following elements:

**id.site** site id, 100 'site1', 100 'site2', 100 'site3'

**y** ordinal outcome taking values 1,2,3

**X1\_cont** a continuous covariate

**X2\_bin** a binary covariate

---

pda	<i>PDA: Privacy-preserving Distributed Algorithm</i>
-----	--

---

**Description**

Fit Privacy-preserving Distributed Algorithms for linear, logistic, Poisson and Cox PH regression with possible heterogeneous data across sites.

**Usage**

```
pda(ipdata=NULL,site_id,control=NULL,dir=NULL,uri=NULL,secret=NULL,
upload_without_confirm=F, silent_message=F, digits=4,hosdata=NULL)
```

**Arguments**

ipdata	Local IPD data in data frame, should include at least one column for the outcome and one column for the covariates
site_id	Character site name
control	pda control data
dir	directory for shared flat file cloud
uri	Universal Resource Identifier for this run
secret	password to authenticate as site_id on uri
upload_without_confirm	logical. TRUE if want silent upload, no interactive confirm

silent_message	logical. TRUE if want to mute message
digits	digits after decimal points in the output json files
hosdata	(for dGEM) hospital-level data, should include the same name as defined in the control file

### Value

control  
control

### References

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analyzing real-world high-dimensional data. Journal of Machine Learning Research. 2025;26(3):1-50.

### See Also

pdaPut, pdaList, pdaGet, getCloudConfig and pdaSync.

---

pdaCatalog	<i>use this function to guide end-users step-by-step to identify best pda models for their tasks, and set up control.</i>
------------	---

---

### Description

use this function to guide end-users step-by-step to identify best pda models for their tasks, and set up control.

### Usage

```
pdaCatalog(task=c('Regression', 'Survival', 'Trial_emulation',
  'Causal_inference', 'Design_analysis', 'Clustering'),
  write_json_file_path=getwd(), optim_maxit,optim_method,init_method)
```

### Arguments

task	user-specified task, c('Regression', 'Survival', 'Trial_emulation', 'Causal_inference', 'Design_analysis', 'Clustering'). If no specify, display all models
write_json_file_path	directory path to write the control file to
optim_maxit	option in the control file for the optimization in pda, default 100
optim_method	option in the control file for the optimization in pda, default "BFGS"
init_method	option in the control file for calculating the initial estimate in pda, default "meta"

### Value

pda control

### See Also

pda

---

pdaGet                      *Function to download json and return as object*

---

**Description**

Function to download json and return as object

**Usage**

```
pdaGet(name,config)
```

**Arguments**

name	of file
config	cloud configuration

**Value**

A list of data objects from the json file on the cloud

**See Also**

pda

---

pdaList                      *Function to list available objects*

---

**Description**

Function to list available objects

**Usage**

```
pdaList(config)
```

**Arguments**

config	a list of variables for cloud configuration
--------	---

**Value**

A list of (json) files on the cloud

**See Also**

pda

---

pdaPut                      *Function to upload object to cloud as json*

---

**Description**

Function to upload object to cloud as json

**Usage**

```
pdaPut(obj, name, config, upload_without_confirm=F, silent_message=F, digits=4)
```

**Arguments**

obj	R object to encode as json and uploaded to cloud
name	of file
config	a list of variables for cloud configuration
upload_without_confirm	logical. TRUE if want silent upload, no interactive confirm
silent_message	logical. TRUE if want to mute message
digits	digits after decimal points in the output json files

**Value**

NONE

**See Also**

pda

---

pdaSync                      *pda control synchronize*

---

**Description**

update pda control if ready (run by lead)

**Usage**

```
pdaSync(config, upload_without_confirm, silent_message, digits)
```

**Arguments**

config            cloud configuration  
upload\_without\_confirm            logical. TRUE if want silent upload, no interactive confirm  
silent\_message   logical. TRUE if want to mute message  
digits            digits after decimal points in the output json files

**Value**

control

**See Also**

pda

---

run\_pooled\_analysis    *Function to perform all data processing and pooled stratified analysis*

---

**Description**

Function to perform all data processing and pooled stratified analysis

**Usage**

```
run_pooled_analysis(data, outcome_id, outcome_time, sites)
```

**Arguments**

data            The combined LATTE\_ADRD data.  
outcome\_id      The name of the primary outcome column.  
outcome\_time    The name of the outcome time column (for Poisson).  
sites            A vector of site identifiers.

**Value**

A list containing the results of the standard logistic and Poisson pooled analysis.

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