

THE IN A HURRY SERIES

The Black Death

in a Hurry

The plague that killed half of Europe

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The Whole Thing in One Page

In the summer of 1349, a manor in Huntingdonshire recorded twenty-two tenants owing labour services who were too ill to work. Most returned after three or four weeks. The rolls do not name their disease, but the timing and concentration make plague the likeliest explanation. In London, other victims were being laid in ordered rows at East Smithfield. The Black Death was lived by people who sickened, recovered, cared, worked and buried their neighbours, as well as by the dead whose numbers now dominate the story.

The agent was *Yersinia pestis*. It can cause bubonic plague, often marked by painful swollen lymph nodes; septicaemic plague, when infection spreads through the blood; and pneumonic plague, when the lungs are involved and close-range respiratory transmission becomes possible. The familiar rat, flea and human sequence describes an important mechanism, not every infection. Wild rodents can maintain plague, different fleas can transmit it, human ectoparasites may have helped in some outbreaks, and pneumonic cases could infect nearby people. Their relative contributions in fourteenth-century Europe remain unsettled.

Ancient DNA places a strain close to the Black Death's major bacterial branching in people buried near Lake Issyk-Kul in 1338 and 1339. It does not reveal the sequence of animals, parasites, goods and travellers that carried descendants west. By 1346 plague was killing around the Black Sea. It reached Constantinople and Mediterranean ports in 1347, crossed western and central Europe during 1348 and 1349, then continued north and east. Caffa, a Genoese city under Golden Horde siege, belongs to this movement. The famous corpse-catapult story comes from a non-eyewitness and is unnecessary to explain the pandemic.

Did plague kill half of Europe? Half conveys the scale, not an audited continental total. A common working range is roughly 30 to 50 per cent, with higher estimates in some scholarship and immense local variation. Tax lists, wills, church vacancies, manorial records, cemeteries and pollen measure

different populations or consequences. Together they establish extraordinary mortality. They cannot produce one exact percentage for every region.

Mass illness and death removed carers, farmers, priests, clerks, sailors and gravediggers while demand for their work rose. Medieval people lacked germ theory, but they watched contact, air, season, movement and place. They prayed, fled, nursed, regulated, made wills and opened burial grounds. Fear also fed flagellant violence, well-poisoning accusations and massacres of Jewish communities already exposed by law, debt and prejudice.

Survival changed the balance between labour, land and employers. Wages and tenant bargaining improved in parts of western Europe; rulers and landlords tried to restrain both. Elsewhere stronger coercion or damaged infrastructure produced different recoveries. Plague did not write one route from mass death to freedom, capitalism or the Renaissance.

Nor did the danger end in the early 1350s. Plague returned for centuries. Ports and towns developed isolation rules, health offices, lazarettos and quarantine because they could not abandon the commerce on which they depended. The Black Death altered Europe where a pathogen met connection, local capacity and power. Biology began the crisis; institutions and repeated human choices shaped its history.

That is the book.

Why You Should Care

A death toll records only the people who did not return. The accounts of Warboys preserve something rarer. In 1349 John Flemmyng was excused from labour for three weeks, recovered and returned to work on the manor. At least fourteen people on the same summer list can be identified in later records, and the true number of survivors may have been higher. The source never gives a diagnosis of plague. Its date, scale and season make plague the strongest explanation, while the missing diagnosis keeps the inference honest.

That small record changes the human picture. The Black Death is often compressed into skulls, carts and a percentage. Yet an epidemic is also made of fever, days in bed, care, absence, recovery and the return to obligations before strength or grief has fully passed. Mortality mattered most, but death was surrounded by labour that continued under pressure. Someone still drew water, harvested grain, heard a confession, wrote a will, carried a body and disputed an inheritance.

The pandemic also corrects the map of medieval life. Europe was deeply connected to North Africa and Asia through shipping, caravan trade, pilgrimage, migration, diplomacy and war. Grain, wax, fur, textiles, soldiers, sailors, envoys and enslaved people moved through overlapping circuits. No single traveller needed to cross Eurasia for a pathogen to do so. Repeated local handovers could turn distant ecological events into one vast human disaster.

Its scale forces a second correction. Losing perhaps thirty to fifty people in every hundred is not an ordinary epidemic enlarged. It changes the ratio between demand and available people. A village may survive several deaths while it can still sow, mill, care and bury. Remove enough workers and knowledge at once, and failure moves beyond infected bodies into food, ritual, credit, law and memory. Institutions can continue to exist while becoming unable to serve everyone who needs them.

The Black Death is therefore an unusually severe test of evidence. No European census counted the dead. Chronicles favour horror and moral meaning. Tax lists omit people; wills depend on notaries; burial grounds contain selected bodies; pollen records land use rather than mortality. Ancient DNA can identify a bacterium and its relationship to other strains without naming the route it travelled. The best explanation comes from making unlike sources cooperate without pretending that they measure the same thing.

It is also a test of conduct under uncertainty. Medieval physicians were wrong about bacteria, yet people noticed clustering, contact, season and place. Prayer coexisted with medicine, flight, isolation and care. Civic

organisation coexisted with abandonment. Anti-Jewish massacres were neither an automatic response to mortality nor an inexplicable eruption. Existing prejudice and legal weakness made a minority available for accusation; local authorities, interests and institutions helped decide whether rumour became protection, expulsion or murder.

The aftermath is equally resistant to a single story. Labour scarcity raised the value of workers, but laws, property, mobility and coercion determined who could retain the gain. England's wage controls, western European tenant bargaining, eastern European lordship and Egypt's irrigation economy did not produce one result. The shock changed what was possible. Institutions distributed the possibilities.

Modern epidemics differ in pathogen, medicine, demography, government and information. The Black Death is not a policy manual. Its lasting value is sharper: separate the agent from the routes of exposure, ask where capacity will fail, and follow who controls the recovery. Connection sustains societies while carrying danger, and public action protects while distributing costs and compulsion. A catastrophe begins biologically. It becomes historical through the systems people depend on and the choices made when those systems are under strain.

The Core Ideas

Plague Was a Living System, Not a Single Chain

The shortest correct explanation of the Black Death is that *Yersinia pestis* killed people. It is correct because ancient DNA recovered from fourteenth-century remains identifies the bacterium. It is short because the name of an agent does not explain how that agent became a pandemic.

Plague persists in nature through relationships among mammals, fleas and local environments. Some rodent populations can maintain the bacterium without every infected animal dying at once. In a susceptible population, an animal outbreak can kill hosts and disturb the fleas feeding on them. Hungry infected fleas may then bite other mammals, including humans. The classic

account emphasises a flea whose foregut becomes blocked by bacterial growth, causing it to feed repeatedly and regurgitate infected material. Other flea mechanisms can transmit earlier, before a complete blockage forms. Ecology supplies several doors. Humans may amplify transmission during an epidemic without becoming a reservoir that maintains plague between outbreaks. That distinction separates the chain visible during a crisis from the animal and environmental conditions that allow another crisis to begin.

Once inside a person, the route and site of infection shape the disease. Bubonic plague usually follows inoculation through the skin. Bacteria travel to lymph nodes, which may swell into painful buboes in the groin, armpit or neck. If infection spreads through the bloodstream, septicaemic plague can cause bleeding, tissue damage and rapid collapse. If the lungs become infected, pneumonic plague can develop. Respiratory droplets from a person with pneumonic disease can transmit plague at close range. These are clinical forms of one infection, not three unrelated diseases, and one form can lead to another.

That biology explains why the universal rat story is too neat. Black rats and their fleas could have been important in houses, ships, warehouses and grain systems. Yet medieval Europe did not have one rodent ecology, one flea species, one season or one housing pattern. Models have shown that human fleas and body lice could, under some assumptions, reproduce the speed of several recorded outbreaks. Critics dispute whether those assumptions match real transmission well enough. Pneumonic spread may have intensified some clusters without carrying an entire continental wave. The balance probably changed by place and episode.

Human vulnerability varied too. Age, prior health, nutrition, exposure dose and the form of disease could affect survival, although skeletal cemeteries cannot settle those effects for every population. War, displacement, harvest failure and poverty could increase exposure or reduce resilience without becoming alternative causes of plague. A well-fed person did not possess immunity to *Y. pestis*. A hungry household had fewer reserves when illness removed workers and carers.

The useful unit is therefore not the bacterium alone. It is an ecological system that contains reservoirs, vectors, hosts, built environments, seasons and human behaviour. Ships did not transport a naked microbe. They carried people, food, rope, bedding, animals and parasites through ports that stored grain and received travellers. Houses connected bodies through care and clothing. Roads moved soldiers, merchants and refugees into fresh communities. The same pathogen could pass through different combinations and still leave plague behind.

This is the first condition the rest of the book must repay. If plague depended on a living system, stopping it required more than identifying one guilty creature. Medieval people could remove refuse, restrict movement, isolate arrivals or abandon a house without knowing which link they had interrupted. Later governments built institutions around those partial effects. Their measures worked unevenly because the system they were trying to govern was never one chain.

The Pandemic Moved Through Overlapping Routes, Not One Road

A map of the Black Death usually draws arrows from Asia to the Black Sea, through the Mediterranean and across Europe. The arrows are useful for orientation and dangerous as evidence. They turn a sequence of outbreaks into a traced passage, then make every gap look like a road waiting to be coloured in.

The strongest recent clue to the pandemic's deeper source comes from cemeteries near Lake Issyk-Kul in present-day Kyrgyzstan. Gravestones dated 1338 and 1339 describe deaths from pestilence. DNA from several people buried there contained *Y. pestis*. Reconstructed genomes sit close to the common ancestor of the major bacterial diversification associated with the Second Plague Pandemic. Modern plague reservoirs in the Tian Shan region strengthen the case for a local emergence. None of that identifies the merchant, army, animal population or sequence of handovers that carried descendants west.

The gap matters because Central Eurasia was not crossed by one commercial institution. Pastoral movement, imperial roads, tribute, warfare, caravan trade, grain markets and regional shipping overlapped. The Mongol empires had enlarged contact across much of Eurasia during the thirteenth century, but political integration neither made every route safe nor turned the continent into one corridor. Plague could move through connected local systems even when nobody travelled from Issyk-Kul to Italy.

By 1346 severe mortality was reported around the lower Volga and Black Sea. Caffa, a Genoese port in Crimea, was besieged by forces of the Golden Horde. Gabriele de' Mussi later wrote that attackers hurled infected corpses into the city. He wrote from Piacenza and was not an eyewitness. The episode may preserve knowledge of epidemic disease during the siege, yet it cannot prove a successful act of biological warfare or explain every subsequent outbreak. Plague did not need a catapult. People already crossed lines of conflict, and commercial traffic resumed.

Research on Black Sea grain and embargoes supplies a better warning against cinematic compression. Plague took time to move from outbreaks in 1346 towards Constantinople and Mediterranean ports in 1347. Warfare and trade restrictions interrupted some commodities while travellers continued to move. Peace reopened exchange. Ships then connected Constantinople, Alexandria, Sicily, Genoa, Venice, Pisa, Marseille and many smaller ports through different voyages. An infected vessel could introduce plague without its crew knowing which person, flea, rodent or bundle mattered.

After landfall, movement changed scale. Coastal shipping carried disease around the Mediterranean and Atlantic edges. Roads joined ports to market towns and capitals. Armies, courts, pilgrims and merchants created long links, while neighbours, carers, clothing and household goods created short ones. Winter did not stop the pandemic everywhere, and speed varied. Local ecology could delay, accelerate or redirect transmission. Political borders rarely formed sealed epidemiological borders.

This explains why Caffa can be important without being the origin, and why the Silk Roads can matter without supplying one plague caravan. The

pandemic's reach came from overlap. Many people moved locally; a few crossed longer distances; goods changed carriers; animals occupied stores and ships; outbreaks bridged systems. Continental consequence did not require continental travellers.

The route map should therefore be read as a field of plausible connections with unequal evidence. Dates establish that one outbreak preceded another. Trade, war and migration identify possible channels. Genomes reveal relationships among bacterial strains. None alone names the full path. History becomes stronger when an arrow ends where proof ends.

“Half of Europe” Is a Scale Claim, Not a Counted Total

The title says the Black Death killed half of Europe because half conveys the right order of shock. It should not be mistaken for a receipt.

No institution counted every European life before and after the pandemic. The continent itself had no agreed statistical boundary, and its population around 1347 is reconstructed from local evidence. Historians commonly place mortality somewhere around 30 to 50 per cent, while some influential estimates run higher. Individual cities, religious houses, villages and estates could lose more than half. Other regions appear to have suffered less. A continental average cannot tell a reader whether the number for one place was twenty, forty or sixty per cent.

The records are powerful precisely because they are incomplete in different ways. Manorial court rolls may show tenants disappearing and holdings changing hands, but miss servants and mobile labourers. Tax lists exclude people who were untaxed, concealed or already gone. Wills rise when people expect death, then fall when notaries and testators are overwhelmed. Clerical vacancies reveal deaths among office holders, not the population at large. Chronicles report impressions, rounded totals and moral meaning. Burial grounds contain bodies selected by place, practice, preservation and excavation.

Even apparently direct numbers need denominators. A monastery losing

twenty monks suffered differently if it began with thirty than if it began with two hundred. A list of empty houses may record death, flight, household merger or later administrative delay. A cemetery's age profile can test whether mortality was random among those buried, but cannot automatically reconstruct the people who escaped, were buried elsewhere or left no recoverable skeleton. One source may be accurate about its own field and still be useless for a continental percentage.

Environmental evidence widens the field. A large study of fossil pollen from 261 European sites examined changes in cultivation and woodland around the pandemic. Some regions show a marked retreat of cereal agriculture and renewed vegetation, consistent with severe population loss. Others do not. Pollen does not count bodies, and land use can change for several reasons, but the geographical contrast makes one point hard to avoid: the demographic effect was strongly uneven.

Time also changes the calculation. Should the denominator be the population in 1346, after decades containing famine and war, or an earlier peak? Should deaths caused indirectly by abandoned care, hunger and social disruption be included? Should the first wave end in 1351, 1352 or 1353 as plague continued through northern and eastern regions? Later recurrences delayed recovery. Exactness depends on choices the surviving evidence cannot settle uniformly.

None of this reduces the catastrophe. A range of 30 to 50 per cent describes a loss so large that ordinary intuition fails. Imagine every second household altered by death, then remember that mortality did not distribute itself one person per house. Some families vanished. Others survived intact. Some institutions lost the people who held their knowledge. Others absorbed property and responsibility from the dead.

The correct response to uncertainty is not to choose the lowest estimate and sound cautious. It is to preserve both scale and variation. "Half of Europe" is defensible when it means that the upper part of the credible continental range approaches one person in two and that many communities suffered losses of that order. It becomes misleading when printed as an exact 50.0

per cent or projected evenly across a map.

Good demographic history keeps the horror and removes the false decimal point.

The Crisis Began Before the Death Toll Was Complete

A mortality estimate counts an ending. An epidemic disrupts a community while many outcomes are still undecided.

The manorial accounts of Warboys offer a rare view of that interval. During thirteen weeks in the summer of 1349, twenty-two customary tenants were recorded as too ill to perform their labour services. Together their entries represent ninety-one weeks of absence. Most returned after three or four weeks; at least fourteen can be identified later in the manor's records. The accounts call their condition illness rather than plague. The exceptional concentration, timing and surrounding mortality make plague the likeliest explanation, but the roll cannot diagnose any individual.

The sample is narrow. It contains tenants who owed labour and whose absence mattered to one unusually careful administration. It misses children, servants, landless workers, people who found substitutes and anyone whose sickness was never entered. It cannot produce a village infection rate. What it proves is smaller and valuable: some people in a community under Black Death conditions became unable to work for weeks and returned. The history of the pandemic must contain sickness and recovery as well as burial.

That missing interval changes the mechanics of catastrophe. A household needed someone to fetch water, prepare food, watch children, tend animals and care for the patient. When several people were ill together, the healthy carried more work while entering closer contact. Wealth could buy space, provisions, servants or flight. Those advantages often transferred exposure to servants and carers. Poorer households had fewer reserves and less room to separate anyone.

The same pressure spread through institutions. Priests heard confessions and buried parishioners. Notaries wrote wills. Bakers, millers and carriers moved food. Clerks recorded transfers. Gravediggers opened earth. Illness reduced the supply of these workers before death removed some permanently, while demand for many of their services climbed. A court could still meet and leave cases unheard. A church could remain open and fail to reach every dying person. Continuity did not guarantee adequacy.

Contemporary accounts emphasise flight, abandoned obligations and altered funerals because breakdown was memorable. Other evidence records work that continued. Towns issued rules, religious communities appointed replacements, neighbours and paid carers entered infected houses, and London's East Smithfield cemetery received bodies in organised rows. Order survived in fragments because people kept performing dangerous tasks. Those fragments should not be mistaken for normal capacity.

Timing made the same mortality more or less destructive. Illness during harvest threatened food and rent. A port losing sailors could strand ships and cargo. A monastery might retain its buildings but lose the people who carried its routines and memory. Previous famine, war, debt or weak harvests narrowed the margin in some places without making Europe one uniformly exhausted patient.

The useful question is therefore not whether society collapsed. It is which functions crossed the point at which missing people could no longer be replaced in time. Plague harmed bodies first. The wider crisis emerged from care that could not be supplied, work that could not wait and knowledge that died with the people who held it.

Medieval People Were Wrong About Bacteria, Not Blind to Patterns

A fourteenth-century physician could not see *Yersinia pestis*. That fact is decisive and insufficient. It explains why treatment could not target the bacterium. It does not explain everything people believed, observed or did.

Learned medicine in western Europe drew on Greek and Arabic traditions organised around qualities, humours, environment and bodily balance. Corrupted air, celestial influence, weather, diet and individual constitution offered a language for sudden mass illness. The report associated with the Paris medical faculty linked the disaster to atmospheric corruption and astrology. Such explanations were wrong at the microbial level, yet they directed attention towards place, season, air and behaviour rather than treating every death as random.

Religious interpretation operated beside natural explanation. Christians could understand plague as divine judgement and still seek a physician, leave an infected street or regulate burial. Muslim writers debated plague within traditions concerning providence, martyrdom and flight while also recording symptoms and movement. Jewish communities prayed and fasted while confronting disease and persecution. Providence did not eliminate practical action. Medieval categories allowed several causes to occupy the same event.

Observation created partial knowledge. People noticed that illness clustered, that contact and movement could be dangerous, and that some places became infected before others. They used fires, perfumes, changes of diet, bloodletting, medicines, lancing, flight, household separation and restrictions on travellers. Many remedies were ineffective; some added harm. Flight could protect the person leaving and carry exposure elsewhere. Isolation could interrupt contact without revealing why. An action can have an epidemiological effect under a mistaken theory. After 1350, plague treatises accumulated descriptions, preventive regimens and arguments from earlier waves. Their authors did not converge on germ theory, but recurrence turned one shock into a body of comparison. Medieval knowledge could develop while remaining inside a false causal framework.

Care remained central. Family members, neighbours, clergy, physicians, surgeons, nurses and servants entered infected rooms. Some were compelled or paid; others acted from obligation or charity. Wills funded hospitals, religious houses and alms. Municipal governments appointed

workers to remove bodies and clean streets. There was abandonment and profiteering, but the claim that everyone fled is contradicted by the amount of dangerous labour still performed.

Fear also searched for human intention. Long before the plague, European Jewish communities lived under systems that combined protection, taxation, legal separation, debt relationships and recurrent hostility. During 1348 and 1349, accusations that Jews had poisoned wells spread across parts of the continent. Torture produced confessions, and massacres destroyed communities. Violence occurred in some places before local plague mortality could have supplied the alleged evidence. Pope Clement VI condemned the accusations and noted that Jews were dying too and that plague struck where no Jews lived. His intervention did not stop the killings.

The pattern was neither a spontaneous reflex shared by all Europe nor a central conspiracy. Local rulers, councils, guilds, creditors, debtors and crowds had different incentives and capacities. Some authorities protected Jewish residents; others expelled, surrendered or killed them. Flagellant movements could turn public penance into anti-clerical and anti-Jewish aggression, while ecclesiastical and secular authorities sometimes suppressed them. Pre-existing stigma determined who could be made to carry uncertainty.

The right correction is not that medieval people were secretly modern. They lacked the decisive causal model, effective antibiotics and laboratory diagnosis. It is that wrong explanation coexisted with sharp observation, practical experiment, institutional action, care and calculated violence. Ignorance did not produce one behaviour. Power selected among the behaviours available.

Labour Scarcity Changed Bargaining Conditions; Institutions Decided Who Kept the Gain

When people became scarce, their work became harder to replace. That is the economic fact beneath the Black Death's social consequences. It is not the same as saying that every survivor became richer or free.

The immediate shock was disorderly. Farms lost workers and tenants. Lords, churches and towns lost rents, dues, taxes and customers. Land and livestock could be abandoned. Demand for some goods fell with population, while demand for burial, care and scarce skills surged. Prices and wages moved at different speeds. An heir might receive several holdings and no healthy team to work them. A labourer might command more pay while food, housing and legal security remained uncertain.

England supplies unusually dense evidence. The Crown's Ordinance of Labourers in 1349 and Parliament's Statute of Labourers in 1351 tried to compel work, restrict movement and hold wages near earlier levels. This was a major national intervention in the labour market, backed first by dedicated royal justices and later by justices of the peace. It had some early effect, but it did not restore the 1340s. Local manorial and borough courts used its public enforcement provisions far less consistently than older accounts implied.

Failure was still consequential. The laws turned workers' mobility and pay into matters of national policy, encouraged litigation over employment agreements and widened the state's claim to regulate labour. Employees, employers and rival hirers used or faced different parts of the new legal framework. A rule can fail at its stated economic purpose while changing institutions, contracts and the language through which conflict is heard.

Over the following decades, many English tenants negotiated rents, commuted labour services or left holdings that no longer suited them. Wage labour expanded, living standards improved for parts of the population, and serfdom weakened. None began from zero in 1348. Labour services, land markets and commutation had longer histories. Lords retained courts and property. Peasant leverage depended on the ability to move, combine, litigate or refuse, and those capacities differed by region and status.

The contrast beyond England breaks any automatic story. In parts of western Europe, abundant land and competing employers helped loosen personal dependence. Where landlords held stronger jurisdiction, states restricted movement or later export demand increased the value of

controlled labour, coercion could harden. The later growth of so-called second serfdom in eastern Europe cannot be assigned to one plague wave, but it disproves any law by which population loss automatically destroys lordship.

Mamluk Egypt offers another contrast. Severe mortality struck an economy dependent on labour-intensive irrigation, central revenue and canal maintenance. Population loss could damage the infrastructure that made high agricultural output possible, reducing the surplus available to rebuild it. England's land, institutions and labour market did not face the same hydraulic problem. The bacterium was shared; the productive systems were not.

Inheritance redistributed assets without guaranteeing equality. Survivors could acquire land, tools, clothing and housing from dead relatives. Institutions and wealthy families could also accumulate abandoned property. Those who owned nothing before plague did not inherit an estate by demographic magic. Women's opportunities could widen through widowhood, inheritance or labour demand, then narrow under guild rules, remarriage, property law and male authority. English court rolls do not support a continent-wide emancipation of women.

Higher income per person can coexist with grief, exclusion and concentrated wealth. A smaller population may have more land per head while public revenue falls and collective infrastructure decays. Real wages can rise while rulers criminalise mobility. Consumption can improve for survivors while people without claims to land remain exposed. Distribution turns an average into a society.

The Black Death changed constraints rather than issuing an outcome. Scarcity opened bargaining space. Law, property, mobility and coercion decided who could enter it and what they could keep. That is why plague belongs in the history of labour and living standards without becoming the sole author of capitalism, freedom or the modern West.

The First Wave Passed, but Plague and the Machinery Built Against It Remained

The dates 1347 to 1353 make the Black Death look like a completed event. For people born after the first wave, plague was a recurring condition of life.

A major return in 1361 struck populations that had rebuilt households and institutions around the earlier losses. Later outbreaks visited European, Mediterranean and Middle Eastern communities at irregular intervals for centuries. They differed in reach and severity. Some were local, others regional. The biological explanation of recurrence is still not fully settled. Ancient genomes show diversification through the Second Plague Pandemic, but they do not decide whether every later European outbreak came from a long-lived reservoir within or near Europe, repeated introductions from farther east, or a mixture.

Recurrence changed the problem. In 1348 many governments improvised under an unfamiliar scale of mortality. Later towns could remember which offices, rules and spaces had been created before. Memory remained imperfect because officials changed, theories remained wrong and commercial pressure resisted closure. Yet plague became an administrative category. Authorities watched reports, marked infected houses, regulated funerals, controlled movement, appointed health officers and created places of isolation.

The Adriatic city of Ragusa, now Dubrovnik, issued a famous order in 1377 requiring arrivals from infected places to spend thirty days apart before entering. Later practice extended periods and helped produce the word quarantine from the Italian for forty. Italian cities developed lazarettos, permanent or semi-permanent health magistracies and networks of correspondence. Measures spread unevenly, often after local political conflict. Public health did not arrive as one invention on one day.

These institutions bought time rather than certainty. A port might isolate travellers while concealed infection entered with another ship. Closing markets could reduce contact and destroy livelihoods. Flight rules could trap

the poor while elites left. Guards, passes and cordons depended on payment and compliance. Hospitals separated some cases and concentrated others. Burial regulation could protect workers or intensify stigma. A health measure was also an exercise of jurisdiction over bodies, property and movement.

The conflict was permanent because cities could not solve plague by ending connection. Grain, labour, credit, tax revenue and political power depended on traffic. A port that closed too early paid an economic price; one that closed too late paid in deaths. Merchants challenged rumours that threatened trade. Neighbouring states concealed or exaggerated reports according to interest. Information became part of defence and competition at once.

Repeated plague also changed the social aftershock. Later waves killed new cohorts, interrupted population recovery and altered the ratio of labour to land again. The first generation's gains could be inherited, taxed or lost. Institutions learned to enforce wage rules, manage cemeteries and monitor movement while households learned that recovery did not guarantee safety. Memory made response more organised without making it humane or effective in every case.

This repays the book's opening condition. Plague began as a living system moving through connected societies. Europe answered by building another system: reports, officers, isolation spaces, passes, boards and rules intended to identify and interrupt dangerous connection. Neither system was complete. The pathogen exploited uncertainty; administration converted uncertainty into delay, classification and coercion.

A durable institutional legacy of the Black Death was therefore not one law or hospital. It was the acceptance that epidemic disease required continuing government before, between and beyond visible outbreaks. The first wave receded. The machinery stayed because the world that needed protection was the same connected world that made protection difficult.

How It Actually Works

A Continent Already Under Strain

The Black Death arrived in Europe after decades that had exposed the limits of growth. Population had expanded across much of the continent during the central Middle Ages. Towns, cultivated land, shipping and market exchange had grown with it. More people could be supported when harvests held and movement kept deficits local. The same density left households and governments with less room when crops, animals or trade failed.

The Great Famine of 1315 to 1317 struck much of northern Europe after severe weather and harvest failure. Warfare and taxation added pressure in several regions. These events neither created plague nor weakened every European in the same way. Their importance lies in stores, debt and resilience. A tenant entering 1348 with grain, kin and credit faced a different margin from one already selling tools or postponing rent.

Europe was also one part of a larger connected zone. Genoese and Venetian merchants operated in the Black Sea and eastern Mediterranean. Mamluk Egypt linked Red Sea, Mediterranean and overland commerce. The Golden Horde governed steppe and river routes north of the Black Sea. People, animals and goods changed hands repeatedly. No authority controlled the whole system, but local circuits overlapped enough for consequences to travel farther than most participants did.

Grain made those circuits unusually intimate. It moved in bulk, accumulated in stores and attracted rodents, while sacks, hulls and warehouses offered shelter to parasites. Yet grain should not become another universal answer. A route carrying food could matter at one stage and human movement at the next. The epidemiological importance of a cargo depended on what lived around it, how long it remained in transit and what happened when it was unloaded.

Plague had a deeper history. The first historically documented plague pandemic began in the sixth century and was caused by *Yersinia pestis*,

which then disappeared from European records for centuries. The fourteenth-century catastrophe opened the Second Plague Pandemic. It was not an old European disease becoming slightly worse. It was a major re-entry or expansion of a lineage into populations and networks that had no living institutional memory of an event on this scale.

The Graves Near Issyk-Kul

From 1885 archaeologists excavated cemeteries at Kara-Djigach and Burana near Lake Issyk-Kul. Among the gravestones were an unusual cluster dated 1338 and 1339 whose inscriptions attributed deaths to pestilence. The sites belonged to a local Christian community living within the commercial and pastoral worlds of Central Eurasia. For more than a century, the graves offered a suggestive date and no identified pathogen.

Ancient DNA changed the value of the clue. Researchers sampled human remains from the cemeteries and recovered *Y. pestis* DNA from several individuals. Two reconstructed bacterial genomes from three infected individuals could be placed on the plague family tree. They formed one strain positioned close to the point from which four major branches associated with the later pandemic diverged. Related plague populations still exist in wild rodents in the broader Tian Shan region.

A bacterial family tree is built from mutations shared or absent among sampled genomes. When several later branches meet near one ancestral node, the pattern records diversification, not a witnessed outbreak. The Issyk-Kul genomes sit just before that branching point. Their position is therefore stronger evidence than geographical proximity alone, although unsampled strains may still change details of the reconstruction.

The finding answers one question strongly. Plague caused at least part of the 1338 and 1339 mortality, and a strain near the source of the Black Death's major diversification was present there. It narrows the likely source region and date far beyond older guesses that ranged across much of Asia.

It leaves the westward sequence open. No genome records whether a marmot hunter, flea, caravan animal, soldier or merchant carried

descendants away. The cemeteries lie years before the well-recorded western wave. Political conflict, pastoral movement and commerce could all connect stages without one traveller crossing the distance. The discovery replaced a continental fog with a source region, not with an itinerary.

The Black Sea Hinge

By 1346 plague was killing around the lower Volga and northern Black Sea. The region joined steppe routes, river traffic, grain production and maritime colonies. War narrowed those connections without ending them. The Golden Horde besieged the Genoese city of Caffa on the Crimean coast while epidemic disease affected the besieging forces and surrounding populations.

The most famous account was written by Gabriele de' Mussi. He described attackers throwing plague corpses over the walls so that the stench and infection would destroy the defenders. The image is unforgettable, which is one reason it has carried more weight than its source can bear. De' Mussi wrote in Piacenza and does not appear to have witnessed the siege. His account shows that contemporaries associated Caffa, warfare and plague. It cannot establish the mechanics of transmission, and Europe did not require a successful corpse attack to become infected.

Commercial evidence produces a slower sequence. Warfare and embargoes disrupted Black Sea grain traffic during 1346 and 1347. People still crossed political lines while some commodities did not. When settlements reopened trade, ships and cargo moved again. Plague reached Constantinople by 1347 and spread through eastern Mediterranean routes. The delay matters. A single dramatic escape from Caffa is less plausible than several introductions through a changing system of travel, storage and exchange.

The disease moved south and west as well as into Europe. Constantinople, ports of the Levant, Alexandria and Cairo suffered within a pandemic spanning western Eurasia and North Africa. The European title marks this book's centre of gravity, not the event's natural border. Mediterranean

shipping tied these regions into the same dangerous season.

Sicilian accounts place plague at Messina in October 1347. Ships arriving from the east brought sick and dying people. Local authorities expelled vessels, which could redirect danger rather than remove it. From Sicily and other landfalls, the disease reached Genoa, Venice, Pisa, Marseille and further ports around the western Mediterranean. Each arrival began another set of local contacts. The pandemic entered Europe through several doors. Port records are least complete at the exact moment readers most want a passenger list. Illness at sea, rejection by one harbour and unloading at another could break the documentary chain while preserving the epidemiological one.

A medieval merchant vessel was a confined workplace and a moving store. Crew slept close together, food and water had to last, cargo shifted between holds and quays, and rodents or fleas could leave without appearing on any manifest. Voyage time could outlast an individual's illness while another host or vector kept the chain moving. A ship could therefore arrive after deaths at sea, during an outbreak or with danger still hidden.

The Moving Front, 1348 to 1353

During 1348 plague crossed Italy, southern France and the Iberian kingdoms, reached Avignon and Paris, and travelled towards the Channel and Atlantic. It moved through commercial roads, coastal traffic and ordinary proximity. News often arrived before disease. Towns could bar travellers or suspect goods, but reports were delayed and symptoms did not announce the point of infection.

England's first securely recorded outbreaks appeared in the south-west during 1348. Plague then reached London, where mortality intensified through the winter and following spring. Emergency burial grounds opened at East Smithfield and West Smithfield. Rural parishes, religious houses and estates recorded deaths through missing tenants, vacant benefices and rapid transfers of land.

From France and the Low Countries, outbreaks moved into

German-speaking lands during 1349. Northern routes carried plague towards Denmark, Norway and Sweden. Other waves passed through Alpine, central and eastern regions. The Baltic and Rus lands belonged to the later edge of the first great movement, with outbreaks continuing into the early 1350s. Dates overlap because there was no one advancing line. A region could contain infected and unaffected districts at the same time.

Political action could redirect movement. Towns denied entry, merchants sought alternative ports, and people fled into surrounding areas. War moved armies and refugees. Religious processions placed crowds together while seeking protection. Markets joined producers and consumers. Household nursing joined the sick and healthy. Every response changed contact patterns, sometimes in opposite directions from its intention.

Season and settlement then shaped the pattern. Dense towns supplied many close contacts but were not the only places devastated. Villages received travellers, shared labour and sent produce to market. Mountain, wetland and steppe environments supported different mammals and parasites. Some areas escaped the first approach and suffered later. Others recorded severe deaths without the urban rat ecology often assumed by popular accounts. The moving front was a collection of local epidemics linked in time, not one weather system covering the map evenly.

Violence against Jewish communities spread through parts of the Holy Roman Empire, Switzerland and neighbouring regions during 1348 and 1349. Accusations of well poisoning converted an invisible cause into a deliberate enemy. Torture made the rumour look documented. Some councils and rulers protected Jewish residents; others permitted or organised massacre and confiscation. The timing varied, and killings could precede local plague. Disease created fear, while older legal vulnerability and material interests shaped its target.

Inside an Infected Community

Plague first appeared as illness in one body. After exposure, a person might develop fever, exhaustion and a painful swelling in the groin, armpit or neck. Bloodstream infection could cause rapid deterioration without a visible bubo. Lung involvement brought coughing and the possibility of direct respiratory spread. Medieval descriptions do not let modern clinicians assign one form to every case, and one form could develop into another.

The Warboys accounts recover part of what death records miss. During the summer wave, recorded absences lasted from one to nine weeks; most fell at three or four. The clerk named illness, not plague, so diagnosis remains an inference. The list nonetheless shows a community carrying weeks of incapacity while mortality continued around it. Custom shaped who bore the work of illness. A 1251 survey of other Ramsey Abbey manors stated that a wife might stay home to care for a sick tenant or that the abbot would supply a substitute. Prescribed customs are not proof of what every household did in 1349, but they show that care and replacement labour were institutional problems before the epidemic.

A household then became a system of care and substitution. Someone had to fetch water, prepare food, change bedding, tend animals, watch children, summon clergy, find a notary and dispose of waste. Close care increased exposure while abandonment reduced the patient's chance of help. Wealth could purchase space, provisions, servants and flight, but servants bore the risk transferred to them. Poor households had fewer rooms, reserves and substitutes. Religious houses could organise care collectively and lose many members through the same obligation.

Illness and death generated paperwork until the people who made records were overwhelmed. Testators named heirs, settled debts and endowed prayers. Relatives claimed tenancies and goods. Bishops replaced dead clergy. Courts postponed business, then returned to disputes over inheritance, wages and abandoned property. The archive often thins at the height of an outbreak because clerks, witnesses and officials were sick or occupied elsewhere. Silence in a record can therefore signal overload,

migration or administrative failure rather than the absence of an event.

Burial compressed grief into logistics. Ordinary funerals required clergy, bells, processions, graves and time. Repeated deaths shortened rites and forced new grounds or communal trenches. Yet emergency did not erase organisation everywhere. At East Smithfield, London's victims were laid in ordered rows and trenches. The cemetery shows intense mortality and planned disposal together. It represents one city and one designated site, not a template for Europe.

Contemporaries acted through several explanations at once. Physicians advised on air, diet, movement and bodily balance. Clergy called for confession, prayer, fasting and alms. Households burned aromatic substances, changed food or sought medicines. Authorities cleaned streets, regulated animals, removed bodies and watched travellers. Some measures were useless or harmful; some altered contact or movement for reasons their users misunderstood.

The experience repeated in different forms: a bell, an empty stall, a delayed hearing, a vacant benefice, a field without a team. Survivors took on children, property, work and obligations before grief had settled. Status determined what the archive preserved. A dead bishop created a named vacancy; a dead maid might appear only through the wages of her replacement. Migrants, beggars and strangers were easier to exclude from relief and harder to trace after death. The records show the disruption most clearly where institutions needed someone's claim or labour to continue.

The Price of Survival

As the first wave receded, surviving workers met employers who still needed harvests gathered, animals tended and buildings repaired. Competition for labour raised wages and improved terms in many western settings. Landlords reduced rents or accepted different services to keep holdings occupied. People moved towards better offers. Elites described this bargaining as disorder because the old terms had become harder to enforce.

England responded with national law. The Ordinance of Labourers in 1349 required able people to work and sought to restrain wages; the Statute of Labourers in 1351 developed the policy. Dedicated royal justices produced an early burst of enforcement, but local manorial and borough courts used the public provisions unevenly and the wider attempt to restore pre-plague conditions failed. The legislation still mattered. It altered contract disputes, gave government a new role in labour regulation and supplied employers and employees with legal claims they could use against one another.

Property moved with equal force. Widows and children inherited. Holdings accumulated in fewer hands or were divided among claimants. Monasteries, hospitals and wealthy households received bequests. Some survivors ate more meat, bought better cloth or occupied better land; others lost the networks that had supported them. Average resources per person rose more cleanly than equality did.

Church institutions show the same mixture. Clergy died while serving infected communities, benefices fell vacant and replacements could be younger or less experienced. Dioceses, monasteries and parishes also possessed property, offices and written procedures that carried them beyond individual deaths. Loss could weaken local ministry while strengthening an institution that received gifts. The plague did not produce one decline of religion.

Different systems pushed the demographic shock in different directions. Western landlords often competed for mobile tenants. Elsewhere stronger jurisdiction and later commercial incentives could bind labour more tightly. In Egypt, mortality damaged the labour and revenue supporting irrigation maintenance, threatening the productivity on which the state depended. One pathogen altered bargaining, infrastructure and government through different mechanisms.

Living with Return

The first pandemic wave did not grant a plague-free generation. A severe recurrence in 1361 was followed by further outbreaks across Europe and the Mediterranean. Population recovered slowly and unevenly. Later epidemics repeatedly removed children and adults who had survived or been born after the first wave, changed labour supply again and renewed fear.

Repeated exposure converted improvised measures into offices. Towns collected reports, inspected travellers, hired guards and designated burial or isolation sites. Ragusa's 1377 rule ordered arrivals from infected places to remain apart for thirty days. Italian practice later developed forty-day periods, lazarettos and health magistracies. The measures were inconsistent and grounded in pre-germ theories, but they recognised that time, distance and information could interrupt danger. No single explanation securely accounts for the later shift from thirty to forty days. Religious symbolism, medical timing and administrative caution have all been proposed. The institutional point is firmer than the origin story: a waiting period became a governable rule.

Plague administration also enlarged coercion. Officials could confine households, burn goods, close roads and punish concealment. Merchants resisted declarations that damaged trade. The poor were easier to trap than the powerful. A city might protect itself by exporting risk to surrounding districts. Public health grew from the need to coordinate, and coordination always raised the question of whose movement counted as expendable.

Information became infrastructure. A warning from another city could trigger inspection or closure before local deaths rose. It could also be suppressed because declaring plague harmed credit, shipping and food supply. Health officers needed messengers, records and political authority as much as medical knowledge. Over time, correspondence among governments created an epidemic map made from reports and suspicion. The map was imperfect, but it allowed action before every cause was understood.

The long aftermath therefore joined memory to uncertainty. People learned that an outbreak had a geography, that contact could be regulated and that government had a continuing duty. They did not discover one reliable switch. Plague remained an ecological problem moving through commercial and political systems, while those systems built a second network intended to watch the first.

How we know

The Black Death survives through sources that measure different things. Chronicles describe fear, symptoms and public meaning but favour striking events and rounded totals. Wills, court rolls, tax accounts and clerical vacancies reveal deaths, illness and transfers within the populations each institution recorded. Warboys preserves named labour absences, not every sick villager and not a diagnosis. East Smithfield preserves selected burials and *Yersinia pestis* DNA, not a mortality rate for London.

Ancient bacterial genomes connect victims across time and place. The 1338 and 1339 Issyk-Kul genomes identify a Central Eurasian strain close to the pandemic's major diversification. They do not recover the route to Caffa or Europe. Later genomes reveal descent and branching without fully settling local persistence against repeated introduction.

Pollen records changing cultivation at 261 European sites and demonstrates regional heterogeneity. It does not count bodies. Written evidence is richest where administrations preserved it, especially in England and parts of Italy, so those places can become falsely representative. The account is strongest on the pathogen, broad sequence and enormous scale. Exact local transmission shares, continental mortality and many regional aftermaths remain reconstructed rather than observed.

What People Get Wrong

"The Black Death Killed Exactly Half of Europe"

Half is the subtitle's scale, not its decimal. Europe had no complete population register in 1347, and modern estimates combine local records whose denominators, coverage and dates differ. Many continental estimates fall between about 30 and 50 per cent. Some reconstructions place mortality higher; some regions and communities lost more than half; others show less severe disruption.

A single number is easier to remember than a distribution. It also gives catastrophe a clean edge. The evidence instead combines tax records, wills, clerical vacancies, manorial transfers, cemeteries and environmental change. These sources agree on extraordinary mortality while observing different populations and consequences. Records of illness add another warning: the Warboys list records temporary incapacity and return. They reveal sickness without supplying a death rate, and they remind us that flight, delayed recording and recovery also alter the surviving denominator.

Uniform numbers produce uniform explanations. A place losing one person in five faced a different institutional test from one losing three in five. A fall in cereal pollen is evidence of land-use change, not a body count, and a cemetery does not contain everyone who lived in its catchment. Local variation belongs inside the explanation because exposure, settlement, season and resilience varied too. Keep the continental scale. Discard the idea that every district surrendered the same share or that any historian counted all the dead.

"Black Rats Carried the Disease from Asia to Every Victim"

Black rats and their fleas remain credible parts of the pandemic. Rats lived around food stores, ports and houses, and infected fleas can transmit *Yersinia pestis* between mammals. The error is turning an important mechanism into the only mechanism.

Plague ecology varies with rodent hosts, flea species, temperature, housing and season. Models suggest that human fleas or body lice could have helped in some epidemics, but whether their assumptions fit medieval transmission remains disputed. Pneumonic plague can spread between people at close range. Several routes may have operated during one wave or changed in importance from place to place.

The universal rat model joined modern plague research to a visible medieval carrier. Sparse rat remains in an excavated town do not prove rats were absent, while abundant remains do not show that their fleas infected each victim. A reservoir, a vector and a transport route are different things: rodents may maintain infection, fleas may transmit it, and ships or households may bring hosts together. Evidence for one does not establish the others. Archaeology, climate, housing and epidemic timing have to be read together. The Black Death was not a relay race in which every infection passed from rat to flea to person in the same order.

"Mongols Started the Black Death by Catapulting Corpses into Caffa"

A fourteenth-century account by Gabriele de' Mussi says besieging forces threw infected bodies into Caffa. The episode is possible in broad outline and cannot bear the certainty often attached to it. De' Mussi wrote in Italy, was not an eyewitness and shaped a moral story of transmission and guilt.

Plague was already present around the Black Sea. People crossed frontiers during war, and commerce resumed after embargoes and negotiations. Ships linked several eastern Mediterranean and Black Sea ports. Even if corpses were thrown, the act need not have infected the city or launched the European pandemic.

One siege supplies an origin, villain and moment of release, which is why the story endures. It can also turn criticism of a reported military act into blame assigned to Mongols as a people, although Golden Horde forces and neighbouring populations were themselves dying. Caffa was a hinge within a wider epidemic. It was not the trigger pulled on an otherwise safe

continent.

"Medieval People Could Explain Plague Only as God's Punishment"

Divine judgement was a serious explanation in Christian Europe, and religious responses included prayer, fasting, procession and almsgiving. It did not occupy the whole intellectual field. Learned physicians discussed corrupted air, celestial influence, bodily constitution, diet and environment. Observers tracked movement, contact, season and place. People could hold providential and natural explanations together.

The caricature comes from comparing medieval medicine with germ theory rather than with the evidence available at the time. Humoral and astrological models were wrong about the bacterium, and bloodletting could harm. Flight, distance and isolation could still reduce contact for reasons their users did not understand.

Plague writing multiplied after the first wave as authors compared outbreaks, symptoms and regimens. Observation accumulated without becoming microbiology. Nor was there one medieval response. Latin Christian, Byzantine, Muslim and Jewish writers worked within different intellectual and religious traditions, while local authorities acted through their own laws and resources. The opposite rescue story is equally false: noticing contagion did not amount to discovering bacteria, and natural explanations did not guarantee useful treatment. A society can act effectively under a mistaken model and cruelly under a confident one.

"Everyone Abandoned the Sick"

Accounts of flight and deserted households are real. Wealthy people could leave crowded places, servants sometimes deserted employers, and fear disrupted ordinary duties. Yet plague also generated a vast amount of care. Relatives nursed, clergy entered infected homes, notaries wrote wills, workers carried bodies and authorities opened burial grounds.

The abandonment story draws power from literary witnesses such as

Boccaccio, whose sharp scenes capture moral disorientation while selecting the most striking conduct. Administrative and archaeological evidence records continuity less dramatically. East Smithfield's ordered graves required labour, land and planning during London's crisis.

Care was not always voluntary, equal or adequate. It could be paid, compelled and dangerous. Some people were left alone. Much of the work was performed by women, servants, lower clergy and labourers whose names rarely entered chronicles. Hospitals and religious houses could keep accepting patients while losing staff. Total-collapse stories erase the people who maintained food, ritual, paperwork and burial, then mistake a society operating beyond capacity for one without institutions.

"The Black Death Ended Feudalism and Created Modern Europe"

Mass death made labour scarce and land relatively abundant. In much of western Europe, wages and tenant bargaining improved, labour services weakened and mobility increased. These changes were substantial. They were neither immediate nor continent-wide, and several had begun before 1348.

Employers and governments resisted. England's labour laws sought to cap wages, compel work and restrict movement. They failed to restore earlier conditions but changed legal institutions and employment disputes. Lords retained courts and land. In parts of eastern Europe, later political and commercial conditions supported tighter control over peasants. Egypt's labour loss damaged an irrigation system whose maintenance required coordinated resources. One pathogen entered different property regimes.

The myth turns horror into a clean origin story for freedom, capitalism or the Renaissance. It confuses sequence with sufficiency: later change followed plague, but art, state finance, commerce, law and humanism had histories that mortality cannot explain alone. Even England's labour laws combine failure with consequence. They did not restore the old labour market, yet they changed enforcement, contract litigation and the state's claim to

regulate work. Scarcity created bargaining opportunities. Rights, movement, competition and coercion determined which survivors could turn them into durable terms.

"The Plague Vanished after 1352"

The first great European wave weakened at different dates and continued into northern and eastern regions through the early 1350s. Plague then returned. A severe epidemic in 1361 was followed by recurrent outbreaks across Europe and the Mediterranean for centuries.

Textbook dates identify the Black Death's initial sweep, not the end of the Second Plague Pandemic. Ancient genomes reveal later descent and branching, while the balance between local or nearby reservoirs and renewed introductions remains debated. Recurrences also differed in reach, age pattern and severity, so they should not be treated as copies of 1348.

Recurrence explains why emergency measures became institutions. Isolation rules, health magistracies, lazarettos, reporting systems and quarantine developed through repeated exposure. London in 1665 and Marseille in 1720 and 1721 belong to this later history. The final disappearance varied by region and cannot be assigned to one change in rats, climate, housing or policy. Europe did not learn one lesson from one event. Governments built imperfect machinery because plague kept returning after the famous chapter appeared to close.

Use It

Separate Agent, Exposure, Vulnerability and Response

Begin any epidemic explanation with four boxes. The agent is what causes disease. Exposure is how people meet it. Vulnerability is what shapes the chance that exposure becomes severe harm. Response is what households and institutions do before, during and after the event.

The Black Death becomes distorted when one box swallows the others.

Yersinia pestis explains why plague occurred, but not why one route, season or district suffered first. Trade explains movement, but not individual disease. Poverty and hunger can increase danger without manufacturing the bacterium. Quarantine can change exposure without altering virulence. The boxes interact, yet they should remain distinct long enough for causation to stay visible.

This lens prevents moral substitution too. Calling a society unclean does not identify a transmission route. Calling a pathogen deadly does not explain institutional collapse. Ask what changed in each box, then trace the links. A complete account may still be uncertain, but it will be uncertain in the right places. It will also reveal which intervention changes a route, which supports a vulnerable group and which addresses the agent itself.

Ask What a Route Proves

Maps create confidence by drawing continuity. A line from Issyk-Kul to Caffa and from Caffa to Messina looks like movement witnessed from above. In reality, one date may come from a grave inscription, another from a chronicle and another from a bacterial genome. The line between them is an argument.

For every route, ask three questions. What moved: people, animals, parasites, goods or information? What evidence links the points: timing, shared strain, commercial contact or direct testimony? What alternatives remain: several introductions, an unsampled intermediate outbreak or movement by another channel?

This does not make maps useless. It makes them honest. The Black Death's broad westward and maritime sequence is secure while many handovers remain unknown. The same discipline applies to technologies, ideas and commodities. Contact makes transfer possible; resemblance makes it plausible; direct evidence makes a particular route stronger. Do not let an arrow perform work that the sources have not done. A branching bacterial tree and a commercial map can support each other without becoming the same kind of evidence.

Audit the Denominator

A dramatic numerator is rarely enough. Twenty deaths, two hundred vacancies or ten abandoned holdings become meaningful only against the population, offices or properties at risk. The Black Death's mortality debates persist because many sources preserve losses without preserving the complete group from which those losses came.

Check whether compared figures count the same thing. A tax list, a cemetery and a pollen sequence have different units. One records liable people, one buried bodies and one land use. Combining them can strengthen a broad conclusion, such as severe and uneven disruption. It cannot create an exact percentage by arithmetic alone.

Then check time. A population before famine is not the same denominator as a population on the eve of plague. A year's deaths do not equal the first wave's total. A city's residents change through flight and migration. The lens is direct: define the population, place, period and measurement before repeating the number. Precision without compatibility is decoration. Where the denominator remains uncertain, a bounded range with visible assumptions is more informative than one memorable point estimate.

Find the Spare Capacity

Systems fail before every component disappears. The useful question is how much demand can rise, or how many people can be lost, before a function cannot be replaced in time.

During the Black Death, a town could retain a council and still lack gravediggers. A parish could retain a priest and fail to reach every dying person. A manor could retain land and lose the teams needed to cultivate it. East Smithfield shows London creating new burial capacity; the cemetery is evidence of both overload and adaptation.

Look for bottlenecks rather than declarations of total collapse. Which task requires scarce skill? Which office holds knowledge no substitute possesses? Which delay spreads harm into another system? Spare

capacity may be people, stock, credit, space, authority or trusted information. It often remains invisible during normal operation because nobody is paid to celebrate an unused margin. Catastrophe reveals it by removing the margin first. Recovery then depends on whether the lost capacity can be rebuilt, substituted or shared before secondary failures accumulate.

Follow Who Can Convert Scarcity into Power

Scarcity changes relative value. It does not decide who receives the gain. After the Black Death, workers were harder to replace, but bargaining power depended on mobility, legal status, property, collective action and competition among employers.

England's labour laws expose the contest. Higher wage demands existed because workers possessed leverage. Prosecution existed because authorities possessed leverage too. A negotiated rent, an illegal departure and a compelled contract are different outcomes of the same demographic pressure. In other regions, landlords, states or infrastructure systems altered the settlement.

Use this lens whenever a shock makes something scarce. Identify who owns the scarce asset, who can withhold it, who can move, who sets the rules and who can survive delay. Then distinguish average benefit from distribution. More land per survivor did not give land to everyone. Higher wages did not erase dependence. A shock opens a bargaining field; institutions mark its boundaries. Follow incidence as well as headline prices: higher labour cost for one employer can become higher income, exclusion or punishment for different workers.

Watch Uncertainty Choose a Target

An invisible threat creates demand for a visible cause. That demand does not select targets randomly. It falls towards groups already marked as outsiders, debtors, competitors or people under conditional protection.

During the Black Death, well-poisoning accusations drew on older

antisemitism and on legal and economic relationships that made Jewish communities vulnerable. Torture manufactured confirmation. Confiscation and debt cancellation could reward violence. Some rulers protected Jewish residents because law, revenue, obligation or interest pointed the other way. The same fear therefore produced massacre in one city and protection in another.

When examining scapegoating, do not stop at prejudice as an attitude. Trace the machinery. Who can accuse? Which authority accepts the category? What property changes hands? What prior story makes the accusation believable? Who benefits from punishment, and who pays for resistance? Fear supplies energy. Institutions give it a target, procedure and consequence. Rumours become historically powerful when an office, court, militia or council converts them into an authorised act.

The Limits

The four-part model is a discipline, not a complete epidemiological equation. Agent, exposure, vulnerability and response overlap. A response changes exposure; social vulnerability changes who can respond; a pathogen can alter behaviour before diagnosis. Historical evidence rarely assigns a clean share of deaths to each pathway.

The Black Death is also an extreme case. Its mortality, medieval demography, absence of antibiotics, political fragmentation and animal ecology limit direct comparison with later epidemics. Quarantine in a fourteenth-century port cannot be lifted whole into a modern policy argument. Labour effects after losing perhaps a third to a half of a population do not predict the result of a smaller shock.

Use the lenses to separate questions and expose assumptions. Do not use them to pretend that one historical event has already answered a different one.

The One Thing to Keep

Keep the multiplication.

The Black Death was not one cause travelling across a passive continent. A bacterium met reservoirs and vectors. Those met ships, roads, markets and households. Exposure met health, age, nutrition, space and care. Mass illness met burial systems, farms, churches, courts and governments. Population loss met property, law and coercion. Change at any layer altered the result without making the other layers optional.

That is why the same pandemic can support statements that seem to conflict. Plague was a biological event and a social disaster. Connection spread danger and sustained life. Institutions preserved order and organised persecution. Labour scarcity improved terms and provoked coercion. Quarantine protected communities and enlarged state power. Each pair becomes intelligible once the layers are kept together.

The permanent change in view should be this: never explain a catastrophe by naming the force that began it. Ask what carried it, what amplified it, what absorbed it and who controlled the aftermath. The initiating shock matters. The conditions through which it travels and the institutions that answer it shape what follows.

Terms

Black Death. The name now given to the catastrophic plague wave that struck western Eurasia and North Africa in the mid-fourteenth century. Contemporaries used other descriptions, including great mortality or pestilence.

Second Plague Pandemic. The long era of recurrent plague conventionally beginning with the Black Death and continuing for centuries. Regional endpoints differ, so it should not be imagined as one continuous outbreak.

***Yersinia pestis*.** The bacterium that causes plague. Ancient DNA from fourteenth-century victims confirms it as the agent of the Black Death, while ecology and social conditions explain how infection became pandemic.

Zoonosis. An infection maintained in animals that can pass to humans. Plague is zoonotic because *Y. pestis* circulates among mammal hosts and

reaches people through vectors, tissues or respiratory transmission.

Reservoir. A host population or ecological setting in which a pathogen can persist over time. Identifying plague reservoirs matters because human epidemics can begin when infection spills from them into susceptible hosts.

Vector. An organism that transmits a pathogen between hosts. Fleas are plague vectors. The term identifies a route of transmission and should not be confused with the animal population maintaining the bacterium.

Epizootic. An epidemic among non-human animals. A plague epizootic can kill susceptible rodents, disturb infected fleas and increase contact with other hosts, although the exact pattern varies by ecosystem.

Flea blockage. Growth of *Y. pestis* can obstruct a flea's foregut, prompting repeated feeding and regurgitation of infected material. It is a classic transmission mechanism, not the only way fleas can spread plague.

Early-phase transmission. Flea transmission occurring soon after an infectious blood meal, before a mature blockage develops. It helps explain why plague ecology cannot be reduced to one late-stage mechanism.

Bubonic plague. Plague in which bacteria usually enter through the skin and reach lymph nodes. Fever and painful swollen nodes are characteristic, though historical descriptions cannot classify every medieval case securely.

Septicaemic plague. Plague in which bacteria multiply in the bloodstream, causing systemic illness, bleeding and tissue damage. It can arise directly or follow bubonic infection and may progress without an obvious swelling.

Pneumonic plague. Plague involving the lungs. It can develop from infection elsewhere or be acquired through close-range respiratory droplets, creating the main route for direct person-to-person transmission.

Case fatality. The proportion of diagnosed cases that die, distinct from the proportion of an entire population lost. Modern untreated rates cannot be applied mechanically to incomplete medieval case records.

Epidemic. Disease occurrence above the expected level in a population or

area. The Black Death consisted of linked local and regional epidemics whose timing and intensity differed across the wider pandemic.

Pandemic. An epidemic spread across countries or continents with sustained transmission. The word describes geographical reach, not a fixed mortality threshold or one identical experience in every affected place.

Ancient DNA. Genetic material recovered from old biological remains. Degraded fragments from teeth and bone can identify pathogens, but contamination control, preservation and sampling determine what conclusions the evidence can support.

Genome. The complete genetic material of an organism. Reconstructed plague genomes let researchers compare strains, identify shared mutations and infer relationships, while missing samples limit the resulting family tree.

Phylogeny. A reconstruction of evolutionary relationships, often represented as a branching tree. Plague phylogenies connect ancient and modern genomes but do not by themselves reveal the people or routes that carried them.

Polytomy. A point on a family tree from which several branches appear to diverge close together. The plague polytomy marks major diversification around the source lineage associated with the Second Pandemic.

Issyk-Kul. A lake region in present-day Kyrgyzstan near cemeteries containing plague victims dated 1338 and 1339. Their genomes provide the strongest current evidence for the Black Death's immediate source region.

Caffa. A Genoese trading city in Crimea, now Feodosia, besieged during plague around the Black Sea. Its importance is secure; the famous corpse-catapult account remains uncertain and non-essential.

Miasma. Harmful or corrupted air believed to cause disease. Miasmatic thinking was wrong about bacteria but directed medieval attention towards environment, smell, ventilation and place.

Humoral medicine. A medical system explaining health through balances

among bodily humours and qualities. It shaped diet, bloodletting and regimens, and coexisted with religious and observational explanations of plague.

Contagion. Transmission of disease through contact or something carried between people and places. Medieval observers recognised dangerous proximity without possessing a modern microbial theory of infection.

Quarantine. Compulsory separation of travellers, goods or households for a defined period. The word derives from forty-day practice, although Ragusa's documented 1377 order initially required thirty days.

Lazaretto. A designated isolation or plague hospital, often associated with ports. Lazarettos turned separation into permanent infrastructure and placed public health within systems of surveillance and trade control.

Flagellant. A participant in public penitential movements involving self-whipping. Some groups sought divine mercy during plague, while parts of the movement became disorderly, anti-clerical or violently anti-Jewish.

Pogrom. An organised or tolerated attack on a minority community. The term is later than the Black Death, but describes massacres of Jewish communities driven by well-poisoning accusations, prior hostility and local power.

Statute of Labourers. An English law of 1351 that sought to restrain wages and compel work after mass mortality. It records both labour's increased leverage and the state's effort to contain it.

Manorialism. A varied system linking landed estates, tenant holdings, rents, labour services and local courts. Its regional forms shaped how population loss altered bargaining, tenure and coercion after plague.

Go Deeper

Thomas Asbridge, *The Black Death: A Global History*

Start here for the newest large-scale narrative written for general readers. Asbridge follows the pandemic across Europe, Byzantium, the Near and Middle East and North Africa, then brings the scale down through individual lives and institutions. Its chief corrective is geographical: the western European story sits inside a wider medieval disaster, with Mamluk Egypt and the Islamic world treated as central rather than marginal. The global title still meets an uneven archive, especially beyond the Mediterranean-connected regions, so read its reach as an argument shaped by surviving evidence. This is the strongest next step for narrative, human experience and an up-to-date synthesis in one volume.

Rosemary Horrox, ed. and trans., *The Black Death*

Read the people who tried to describe the disaster. Horrox assembles translated chronicles, letters, medical writing, legal measures, religious responses and records of social change. The range is its strength: a physician, city government, cleric and landlord did not see the same epidemic. Use the collection slowly and keep asking what action produced each document. Authorities preserve regulation better than disobedience, and literary witnesses select scenes for moral force. This is the best cure for a modern narrative that makes medieval people uniformly passive, irrational or silent. It is also a demanding book because primary evidence rarely arrives with one clean interpretation.

Monica H. Green, “The Four Black Deaths”

Green's 2020 *American Historical Review* article rebuilds the pandemic through historical sources, ancient DNA and the wider Mongol-era world. Its central value is geographical and chronological: the famous western wave becomes one part of a larger biological history whose decisive diversification may predate Caffa by decades. The argument that Mongol movements helped disperse plague is influential and remains an interpretation rather than a traced itinerary. Read it to see how new evidence changes the questions historians ask, and to understand why the origin of a bacterial lineage, its expansion through animal reservoirs and the documented European pandemic are related but distinct problems.

Maria A. Spyrou and colleagues, “The Source of the Black Death in Fourteenth-Century Central Eurasia”

This 2022 *Nature* article presents the Issyk-Kul cemetery evidence. It combines dated gravestones, human remains, plague genomes and modern reservoir geography to place a strain close to the source of the pandemic's major diversification in 1338 and 1339. The technical sections require patience, but the logic is worth following. Notice the discipline of the conclusion: the paper identifies a likely source region and bacterial position, not the merchant, army or route that reached Europe. Read it as a model of what interdisciplinary evidence can settle, what it can narrow and what remains beyond the sample.

Notes and Sources

Scope, title and central model

The name and dates. *Black Death* is a later label for the great plague mortality that reached the Mediterranean in 1347 and crossed much of Europe between 1348 and the early 1350s. Contemporary writers more often described a great mortality, pestilence or plague. Rosemary Horrox's source collection establishes the range of contemporary language and supplies many of the chronicles, medical reports, legal measures and religious responses used here. John Aberth provides the main modern European narrative and follows the story beyond the first wave into recurrence, memory and culture. The book uses 1347 to 1353 as a practical European span, while repeatedly stating that local beginnings and endings differed.

The subtitle and mortality scale. No surviving census permits an exact continental death toll. Estimates depend on reconstructed starting populations, incomplete local records, the geographical definition of Europe and the end date chosen for the first wave. Aberth and the review by Remi Jedwab, Noel Johnson and Mark Koyama support the broad conclusion that mortality was enormous and regionally uneven. The manuscript uses 30 to 50 per cent as a common continental range, acknowledges higher published estimates and refuses a false decimal point. *Half of Europe* is therefore retained as an upper-range scale claim and cover promise, not as a measured 50.0 per cent.

The central model. The four-part model, pathogen ecology, connected movement, local vulnerability and institutional response, is a synthesis rather than a formula taken from one source. Robert Barbieri and colleagues supply the biological and ecological foundation. Hannah Barker supplies the Black Sea movement and commercial hinge. Bruce Campbell integrates climate, harvests, demography and institutions without making pre-plague stress an alternative cause. Mark Bailey and the economic literature support the distinction between demographic scarcity and the institutions that

distributed its gains. The model was chosen over a rat-chain narrative and a purely chronological narrative because it explains both shared causation and divergent outcomes.

The wider event. Monica Green and Michael Dols prevent a European title from becoming a European pandemic. Green places the famous western wave within a larger Mongol-era and biological history. Dols reconstructs plague in the Middle East, including medical, religious and institutional responses. Stuart Borsch's comparison of England and Egypt supports the use of sharply different productive and fiscal systems to test universal claims. Thomas Asbridge's 2026 global narrative was checked as the latest major general synthesis and reinforced the decision to keep the Islamic world and North Africa inside the explanatory frame. North Africa, the Middle East and Central Eurasia remain in the book wherever they are necessary to explain origin, movement or contrast, but the detailed histories of those regions are not compressed into a European frame.

Pathogen, disease forms and transmission

Identifying the agent. Kirsten Bos and colleagues recovered a draft *Yersinia pestis* genome from people buried at East Smithfield and compared it with modern strains. Their work, together with later ancient DNA studies, settles the pathogen identity for the Black Death. It does not establish one universal transmission route. The manuscript therefore treats the bacterium as necessary and decisive while keeping ecology, exposure and vulnerability visible.

Natural history and clinical forms. Barbieri and colleagues provide the main review for plague reservoirs, epizootics, flea transmission, spillover and the bubonic, septicaemic and pneumonic forms. The discussion of blocked fleas and early-phase transmission follows that review. Clinical descriptions are modern categories used to explain mechanisms; the manuscript does not retrospectively diagnose every medieval death from a literary symptom.

Rats, fleas, lice and people. Katharine Dean and colleagues modelled

human fleas and body lice as possible drivers of several European outbreaks and found that their model often fitted reported mortality curves better than a rat-flea model. Park and colleagues challenged the evidential strength of that conclusion, especially assumptions about ectoparasite biology and transmission. The manuscript preserves the live dispute. Human ectoparasites are presented as a plausible mechanism under contested assumptions, not as a new settled orthodoxy. Black rats and rat fleas remain plausible and sometimes important; pneumonic transmission remains capable of intensifying close-contact clusters without being made the complete continental explanation.

Current genomic perspective. Emily Gaul and Maria Spyrou's 2025 review was the newest materially used scientific synthesis checked for this production pass. It supports the growing power of ancient DNA while stressing sampling limits, preservation bias and the continuing geographical concentration of available genomes. The manuscript does not let a bacterial family tree stand in for a complete history of hosts, vectors or travel.

Source region and routes

Issyk-Kul. Maria Spyrou and colleagues combined gravestone dates, archaeological remains, ancient pathogen DNA and comparison with modern plague diversity. Their 2022 *Nature* paper identifies *Y. pestis* in people buried near Lake Issyk-Kul in 1338 and 1339 and places the reconstructed strain close to the ancestral node preceding the major diversification associated with the Second Plague Pandemic. Modern reservoirs in the wider Tian Shan region strengthen the local-source interpretation. The source supports a likely immediate source region and date. It does not identify the carrier, the route west or every intermediate outbreak.

The Mongol-era frame. Green argues that the biological history must be placed within the movements and disruptions of the wider Mongol world. The manuscript retains that enlarged geography and treats Mongol imperial connections, warfare and pastoral mobility as relevant conditions. It does not present a traced plague itinerary across the empire or imply that political

integration created one safe road.

Caffa and biological warfare. Mark Wheelis made the strongest modern case that the 1346 siege account could describe an early biological attack. The evidence depends heavily on Gabriele de' Mussi, who wrote from Piacenza and was not an eyewitness to the siege. Barker re-examined Black Sea grain, embargoes, diplomacy and movement and reconstructed a slower, interrupted sequence between plague around the Black Sea and Mediterranean outbreaks. The manuscript therefore keeps the siege and the corpse story, labels the provenance problem and rejects the claim that a successful catapult attack is needed to explain Europe.

Mediterranean movement. Barker, Horrox, Aberth and Dols support the sequence through Constantinople, eastern Mediterranean ports, Sicily and the western Mediterranean. Documentary gaps are stated rather than filled with an invented passenger list. Ships are treated as moving workplaces and stores capable of carrying several relevant hosts, vectors and materials. Timing establishes broad precedence and plausible connection, not one witnessed handover at every port.

Mortality, burial and the evidence problem

Uneven land-use change. Adam Izdebski and colleagues analysed 1,634 fossil-pollen samples from 261 European sites to test land-use change around the pandemic. Some regions show strong retreat of cereal cultivation and regrowth of other vegetation, while others do not. The data support geographical heterogeneity in demographic disruption. Pollen measures changing land use, not bodies, and cannot by itself provide a mortality percentage. The manuscript keeps those units separate.

East Smithfield. Ian Grainger, Duncan Hawkins, Lynne Cowal and Richard Mikulski provide the archaeological account of London's emergency cemetery. Ordered trenches and rows support the claim that mass death and organised burial coexisted. Sharon DeWitte's analysis of age patterns among the cemetery's adults supports the narrower point that bioarchaeology can test selection and mortality within a burial sample.

Neither source turns East Smithfield into a sample of all London, England or Europe.

Illness and recovery at Warboys. A. T. Brown, Grace Owen and Barney Sloane analyse one unusually detailed sequence of manorial accounts from Warboys, Huntingdonshire, during the summer of 1349. The rolls record twenty-two customary tenants excused from labour across thirteen weeks and four days, amounting to ninety-one weeks of absence; most returned after three or four weeks, and at least fourteen can be identified in later records. The entries name illness rather than plague. The concentration, season and surrounding chronology make plague the strongest inference, but the record cannot diagnose individuals. Because the source includes labour-obligated tenants whose absences mattered to the manor, it cannot supply a village infection rate, a general recovery rate or the experience of children, servants, landless people and unrecorded households. It is used only to establish that sickness, prolonged incapacity and return belonged inside the Black Death's lived history.

Written records and denominators. Horrox supplies examples of chronicles, wills, clerical vacancies, manorial evidence and legislation. Aberth and Jedwab, Johnson and Koyama discuss the uses and limits of these materials in mortality reconstruction. The manuscript distinguishes office holders from populations, burials from residents, tax liability from presence and land use from death. It rejects arithmetic that combines incompatible units merely because all respond to plague.

Literary witness. Giovanni Boccaccio's opening to *The Decameron* is used as a crafted account of Florence by a wealthy survivor, not as a transparent transcript of every household. Its scenes of flight, disrupted ritual and altered obligation are placed beside administrative and archaeological evidence showing continued work, regulation and burial. No dialogue, private thought or scene has been invented for the narrative.

Explanation, care, religion and persecution

Medicine and natural causation. Horrox includes the report associated with the Paris medical faculty and a range of plague regimens. These sources support the discussion of humours, corrupted air, celestial influence, diet, bloodletting, fumigation and preventive practice. The manuscript calls the microbial model wrong while avoiding the opposite error of portraying every observation as empty superstition. An action such as separation can alter contact under a mistaken explanation.

Religious interpretation. Horrox and Dols show divine judgement, providence, penitence, martyrdom and practical behaviour operating together across Christian and Muslim writing. Religious explanation did not remove medicine, flight, care or regulation. Jewish religious life receives proportionate treatment within a section centred on persecution and vulnerability rather than being made a decorative third example.

Care and institutional continuity. Horrox's records of wills, clerical work, civic orders and appointed workers support the claim that dangerous labour continued. East Smithfield provides material evidence of organised burial. The manuscript includes abandonment and profiteering without allowing Boccaccio's most memorable breakdown scenes to erase carers, servants, clergy, officials, gravediggers and neighbours.

Anti-Jewish violence. Samuel Cohn reconstructs the chronology and geography of accusations, massacres and burnings and shows that violence cannot be explained as one automatic reaction to local mortality. Jedwab, Johnson and Koyama analyse the relationship between plague shocks, prior antisemitism, local institutions and later persecution. Horrox supplies contemporary material, including papal rejection of well-poisoning accusations. The manuscript states that torture produced confessions, that confiscation and debt relations could create incentives, and that local authorities could protect or destroy. It does not imply that every city behaved alike or that one economic motive explains all violence.

Flagellants. Horrox and Aberth support the account of public penitential

movements, clerical concern and episodes of anti-Jewish aggression. Flagellants are not made synonymous with massacre. Their behaviour, reception and suppression differed by place.

Labour, land and the distribution of survival

Immediate economic shock. Jedwab, Johnson and Koyama review evidence on wages, prices, output, urbanisation and long-run development. Their survey supports the claim that severe mortality altered factor ratios while leaving major disputes about magnitude, timing and causation. The manuscript avoids translating a rise in income per head into universal welfare and distinguishes average effects from distribution.

England and labour regulation. Bailey's *After the Black Death* is the main authority for English bargaining, landholding and institutional adaptation. His 2025 study of labour legislation re-examines implementation from 1349 to 1400. The Ordinance of Labourers and Statute of Labourers created an unusual national intervention backed first by dedicated royal justices and later by justices of the peace. Enforcement achieved some early effects but varied sharply across royal, manorial and borough jurisdictions and did not restore the labour market of the 1340s. The legislation nevertheless changed public authority, employment litigation and the contractual claims available to employers and workers. These are English findings. The manuscript uses them to show contested institutional response, not a European model.

Western divergence. Şevket Pamuk traces post-plague real wages and the divergent economic trajectories of European regions. His argument supports the importance of land-labour ratios and institutional differences without proving that plague created the later Great Divergence by itself. The manuscript makes no single-cause claim for capitalism, urban growth or western European predominance.

Egypt. Borsch compares England with Mamluk Egypt and emphasises irrigation maintenance, fiscal institutions and agricultural decline. The comparison supports the narrower proposition that identical mortality

pressure can pass through unlike productive systems and produce unlike recoveries. Dols supplies the wider Egyptian and Middle Eastern plague history. England and Egypt are contrasts, not representative samples of all west and east.

Eastern European coercion. The manuscript uses later second serfdom as a counterexample to demographic determinism, not as a direct product of the 1347 to 1353 wave. The claim is that population loss does not contain one institutional outcome. Pamuk, Campbell and the economic review support that bounded comparison.

Women, inheritance and marriage. Bailey's 2024 article challenges claims that the Black Death directly established the European marriage pattern or produced a broad female emancipation in England. The manuscript retains widened opportunities through labour demand, widowhood and inheritance while showing how property law, guild rules, remarriage and male authority bounded them. No English court-roll pattern is projected across Europe.

Recurrence and public-health machinery

Later genomes and reservoirs. Spyrou and colleagues reconstructed 34 ancient plague genomes from ten archaeological sites in Europe and found low early diversity followed by later branching. Their results support descent and diversification within the Second Plague Pandemic. They do not settle whether all later European outbreaks came from a reservoir inside or near Europe, repeated introductions from farther east, or both. Gaul and Spyrou reinforce that unresolved status.

Recurring waves. Aberth, Horrox and Dols support the return of plague from 1361 onwards and its irregular regional history. The manuscript calls 1347 to 1353 the first great European movement rather than the whole Second Pandemic. It avoids one final European disappearance date because regional sequences differ.

Quarantine. Gianfranco Gensini, Magdi Yacoub and Andrea Conti provide the standard concise history of Ragusa's 1377 thirty-day separation order and the later forty-day practice from which *quarantine* derives. The

manuscript states that public health developed through repeated local rules, offices and spaces rather than appearing complete in 1377. Later Italian lazarettos and health magistracies are described as uneven institutions that protected, delayed, classified and coerced.

What institutions could achieve. The quarantine discussion is historical, not a claim that a single rule eradicated plague. Ports depended on trade, information could be concealed, enforcement was unequal and restrictions imposed costs. The final causal loop, a living pathogen system answered by an administrative system of reports, officers, passes and isolation spaces, is a synthesis drawn from recurrence and institutional history.

Use It, Terms and evidential limits

The six practical lenses are deductions from the book's historical model. They are not presented as instructions that make a medieval pandemic directly comparable to a modern one. The agent-exposure-vulnerability-response distinction follows the organisation of the scientific and historical evidence. The route, denominator and spare-capacity lenses follow the source problems described above. The scarcity and scapegoating lenses follow Bailey, the economic review, Cohn and Jedwab, Johnson and Koyama. Each transfer is labelled analytical and bounded.

The glossary uses current biomedical definitions for pathogen, reservoir, vector, disease forms and genetic terms, with historical limits stated where retrospective diagnosis is unsafe. *Pogrom* is identified as a later term applied descriptively. *Second Plague Pandemic* and its endpoint remain conventions rather than one continuous outbreak. Scientific nomenclature, disease forms and transmission routes were rechecked on 2 September 2026 against current public-health material, including a CDC overview reviewed and updated on 24 August 2026. The current ancient-DNA synthesis was also rechecked on 2 September 2026.

The archive remains uneven. Western and central European written records, English administrative evidence and excavated Christian

cemeteries are overrepresented. Ancient DNA depends on preservation, sampling and laboratory recovery. No source sees all deaths, all routes or all affected communities. The manuscript therefore distinguishes settled pathogen identity, strong source-region inference, plausible route reconstruction, live transmission debate and contested social causation.

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