WNND/AFP associated costs/losses in humans - 15% infection rate	Rate/Data	Source	Reference(s)
General considerations	Rate/Data	Cource	reference(3)
Infection rate (%)	15%	Literature	Charrel RN, de Lamballerie X, Durand JP, Gallian P, Attoui H, Biagini P, De Micco P.Prevalence of antibody against West Nile virus in volunteer blood donors living in southeastern France. Transfusion 2001;41:1320-1
Morbidity rate WNND (%) assuming all WNND are hospitalised	0,70%	Literature	Mostashari F, Bunning ML, Kitsutani PT, et al. Epidemic West Nile encephalitis, New York, 1999: results of a household-based seroepidemiological survey. Lancet 2001;358:261–4.
Case-fatality rate (%) (Western Europe - Greece and Italy)	11%	Literature	EFSA-ECDC, 2014, EU summary report on zoonoses, zoonotic agents and food-borne outbreaks 2012 (EFSA Journal 12:3547)
Percentage of ≥ 65 years old hospitalised	64%	Literature	Berner et al (2005) Archives or gerontology and geriatrics 41:15-21 (http://www.sciencedirect.com/science/article/pii/S0167494304001876)
Mean lenght of work absenteism for WNND (working days, counting on 30 days for recovery)	30		University Hospital, Liège, personal communication
Mean lenght of work absenteism for WNF (flu-like syndrome) (working days, counting on 5 days for recovery)	5	Literature	http://www.cfsph.iastate.edu/Factsheets/pdfs/west_nile_fever.pdf
Loss for the employer during 30 working days	1.5 month gross salary		
Evolution of healthcare costs (%)	3,1% per year	2010-2012	http://www.plan.be/admin/uploaded/201005191119210.proj2010_fr.pdf http://www.nbb.be/doc/DQ/F/DQ3/HISTO/NFDC12.PDF
N patients decesased	717	11% case-fatality rate in the UE	European Food Safety Agency (EFSA) and European Centre for Disease Prevention and Control (ECDC). Information on specific zoonoses and zoonotic agents – West Nile virus. In:EU Summary report on zoonoses, zoonotic agents and food-borne outbreaks 2012. EFSA Journal 2014; 12: 3547
Mean age of deceased patients (years)	78	Literature	Murray KO, Ruktanonchai D, Hesalroad D, Fonken E, Nolan MS. West Nile virus, Texas, USA, 2012. EID 2013; 19:1836-8
		Literature	Zohrabian A, Hayes EB, Petersen LR. Cost-effectiveness of West Nile virus vaccination. Emerg Infect Dis 2006; 12: 375-80.
N patients deceased	717	estimation	
N patients hospitalised (N WNND cases) % of AFP	6.522 3%	estimation Literature	Danis et al. (2011) Outbreak of West Nile Virus infection in Greece, 2010.
70 OF AL 1	370	Literature	EID 17:1968-1872
N patients AFP	196	estimation	
costs - ratio AFP/meningo-encephalitis	1,25	Literature	
			Staples et al. (2014) Initial and Long-term costs of patients hospitalized with West Nile Virus Disease, Am. J. Trop. Med. Hyg., 2014, 90:402-409
Consultation of the general practitioner (N = 6,522 cases [WNND])			
Cost of one consultation of the GP	23,00 €	Literature	http://www.caami-hziv.fgov.be/downloads/tarieven/Tarieven-artsen-010112-F.pdf
Total costs for consultations of GP (6,522 patients)	150.006,00 €		

HOSPITALISATION (	N = 6,522	patients	affected	by WNND)
Serological diagnos	e			

Serological diagnosis
Cost of serological diagnostic test in humans

Total costs of diagnosis for 6,522 hospitali	sed patients	136.962,00 €		
Hospital charges				
Length of hospital stay		9 days	Patient bill	University Hospital (case of encephalitis in 2004)
	Day 1: admission - intensive care unit	1 day	Patient bill	University Hospital (case of encephalitis in 2004)
	Days 2 to 4: intensive care unit	3 days	Patient bill	University Hospital (case of encephalitis in 2004)
	Days 5 to 9: Neurology unit	5 days	Patient bill	University Hospital (case of encephalitis in 2004)
Hospital stay				
Costs of hospital stay		338,00 €		
	Day 1: admission - intensive care unit	156,45 €	Patient bill	University Hospital (case of encephalitis in 2004)
	Days 2 to 9 (22,66 € per day)	181,28 €	Patient bill	University Hospital (case of encephalitis in 2004)
Patient share (Days 2 to 9) - 12,56 € per day		100,48 €	Patient bill	University Hospital (case of encephalitis in 2004)
Clinical lab fee (Days 2 to 9) - 18,91 € per day	/	151,28 €	Patient bill	University Hospital (case of encephalitis in 2004)
Dairy pharmaceutical fee (Days 2 to 9) - 0,62	€ per day	4,96 €	Patient bill	University Hospital (case of encephalitis in 2004)
	patient share + clinical lab + pharmaceutical	595,00 €		
fee				
Pharmaceutical expenses				
Diprivan 1% (Propofol) - general anaesthetic		3,70 €	Patient bill	University Hospital (case of encephalitis in 2004)
Zovirax (Acyclovir - antiviral - herpesvirus) IV I	, .	275,02 €	Patient bill	University Hospital (case of encephalitis in 2004)
Perfusalgan Perf 1 g 1x100 ml (Paracetamol)		16,32 €	Patient bill	University Hospital (case of encephalitis in 2004)
NACL 0,9% Perf 100 ml (12 perfs)		12,84 €	Patient bill	University Hospital (case of encephalitis in 2004)
NACL 0,9% Perf 50 ml (2 perfs)		2,42 €	Patient bill	University Hospital (case of encephalitis in 2004)
Glucose 5% perf 50 ml (21 perfs)		26,04 €	Patient bill	University Hospital (case of encephalitis in 2004)
Diphantoine (Phenytoin - antiepileptic) amp I\		8,15 €	Patient bill	University Hospital (case of encephalitis in 2004)
Depakine chrono comp 500 mg (antiepileptic)		2,40 €	Patient bill	University Hospital (case of encephalitis in 2004)
Dormicum amp 5mg/5ml (Midazolam)		0,82 €	Patient bill	University Hospital (case of encephalitis in 2004)
Actrapid Penfill (fast acting insulin) cart 1 x 3		5,55 €	Patient bill	University Hospital (case of encephalitis in 2004)
Claforan (3rd generation cephalosporin) FL IV	/ 2 g + solv	248,22 €	Patient bill	University Hospital (case of encephalitis in 2004)
Pentrexyl Amp Inj 2 g (Penicillin)		44,31 €	Patient bill	University Hospital (case of encephalitis in 2004)
Clexane (heparin - antithrombotic) Ser Inj 40	5 <i>,</i>	6,74 €	Patient bill	University Hospital (case of encephalitis in 2004)
Clexane (heparin - antithrombotic) Ser Inj 80	<b>5</b> ,	6,74 €	Patient bill	University Hospital (case of encephalitis in 2004)
Dotarem (for diagnosis by magnetic resonance		62,74 €	Patient bill	University Hospital (case of encephalitis in 2004)
Etumine (phenothiazin - antipsychotic) amp 1	x4 ml	0,81 €	Patient bill	University Hospital (case of encephalitis in 2004)
Corsodyl (chlorhexidine digluconate) sol 1 ml		6,44 €	Patient bill	University Hospital (case of encephalitis in 2004)
Miniplasco NACL 0,9% Amp 1 x 20 ml		9,99 €	Patient bill	University Hospital (case of encephalitis in 2004)
Miniplasco KCL 3 g 2 meq/ml 20 ml		1,82 €	Patient bill	University Hospital (case of encephalitis in 2004)
Isobétadine sol hydroalc 1 ml (125 ml flask)		4,10 €	Patient bill	University Hospital (case of encephalitis in 2004)
Total pharmaceutical expenses per patient		745,00 €		
· · ·				
Medical services Admission				
	oto (day 1)	122,37 €	Patient bill	University Hespital (case of anombalities in 2004)
Monitoring of heart function, blood pressure, e	` • •	122,37 € 321,24 €	Patient bill	University Hospital (case of encephalitis in 2004)
Continuous surveillance of heart function (day		,		University Hospital (case of encephalitis in 2004)
Extra-fees for monitoring by a specialised and	i accredited doctor	2,87 €	Patient bill	University Hospital (case of encephalitis in 2004)
Medical imaging		05.04.6	Dotiont Elli	Liniversity Licenital (each of anomhelists to 0004)
X-ray (admission)	line and the basical and income	65,64 €	Patient bill	University Hospital (case of encephalitis in 2004)
Hospitalised patient share for specialised med	aicai and technicai services	16,40 €	Patient bill	University Hospital (case of encephalitis in 2004)

Fees of consultance for an accredited doctor specialised in X-ray diagnosis	15,28 €	Patient bill	University Hospital (case of encephalitis in 2004)
Magnetic resonance imaging of the head	119,41 €	Patient bill	University Hospital (case of encephalitis in 2004)
X-rays of thorax and its content $(N = 3)$	33,18 €	Patient bill	University Hospital (case of encephalitis in 2004)
Extra charges for x-rays performed in a hospitalised patient under surveillance (N = 3)	29,85 €	Patient bill	University Hospital (case of encephalitis in 2004)
Extra fees for urgent medical services performed during night/weekend/public holiday (N=2)	116,20 €	Patient bill	University Hospital (case of encephalitis in 2004)
Clinical laboratory (assays)			
Total cholesterol (N = 1)	0,56 €	Patient bill	University Hospital (case of encephalitis in 2004)
LDL cholesterol (N = 1)	0,50 € 7,51 €	Patient bill	University Hospital (case of encephalitis in 2004)
HDL cholesterol (N = 1)	7,51 € 1,05 €	Patient bill	University Hospital (case of encephalitis in 2004)
Haemoglobin (electrophotometric method) (N = 11)	3,08 €	Patient bill	University Hospital (case of encephalitis in 2004)
Red blood cell count and/or haematocrit (maximum 1) (N = 3)	0,84 €	Patient bill	University Hospital (case of encephalitis in 2004)
White blood cell count (N = 4)	1,12 €	Patient bill	University Hospital (case of encephalitis in 2004)
Platelet count (N = 3)	0,84 €	Patient bill	University Hospital (case of encephalitis in 2004)
Differential leukocyte count (N = 4)	2,24 €	Patient bill	University Hospital (case of encephalitis in 2004)
Thromboplastin time (prothrombin time), including potential fibringen calculation ( $N = 3$ )	1,68 €	Patient bill	University Hospital (case of encephalitis in 2004)
	1,68 €	Patient bill	, , , , , , , , , , , , , , , , , , , ,
Fibringen (N = 3)  Activated partial thromboplestin time (N = 3)	2,10 €	Patient bill	University Hospital (case of encephalitis in 2004)
Activated partial thromboplastin time (N = 3)	,	Patient bill	University Hospital (case of encephalitis in 2004)
Triglycerides (N = 1)	0,70 €		University Hospital (case of encephalitis in 2004)
Lipases (N = 3)	2,61 €	Patient bill	University Hospital (case of encephalitis in 2004)
Amylases (N = 1)	0,87 €	Patient bill	University Hospital (case of encephalitis in 2004)
Urea (N = 4)	1,40 €	Patient bill	University Hospital (case of encephalitis in 2004)
Aspartate aminotransferases and Alanine aminotransferases (N = 4)	1,05 €	Patient bill	University Hospital (case of encephalitis in 2004)
Albumin (N = 3)	1,05 €	Patient bill	University Hospital (case of encephalitis in 2004)
Total bilirubin and its fractions (N = 4)	2,80 €	Patient bill	University Hospital (case of encephalitis in 2004)
Calcium (N = 4)	2,24 €	Patient bill	University Hospital (case of encephalitis in 2004)
Chloride ion (N = 12)	5,04 €	Patient bill	University Hospital (case of encephalitis in 2004)
Plasma or serum bicarbonates (N = 4)	1,68 €	Patient bill	University Hospital (case of encephalitis in 2004)
Magnesium (N = 3)	0,63 €	Patient bill	University Hospital (case of encephalitis in 2004)
Phosphates (N = 4)	1,96 €	Patient bill	University Hospital (case of encephalitis in 2004)
Potassium (N = 13)	7,28 €	Patient bill	University Hospital (case of encephalitis in 2004)
Total proteins (N = 4)	1,40 €	Patient bill	University Hospital (case of encephalitis in 2004)
Protein electrophoresis, with curve and estimations (N = 1)	1,40 €	Patient bill	University Hospital (case of encephalitis in 2004)
CRP (immunological assay) (N = 5)	4,35 €	Patient bill	University Hospital (case of encephalitis in 2004)
Sodium (N = 11)	5,39 €	Patient bill	University Hospital (case of encephalitis in 2004)
Creatin kinases (CK) (N = 4)	2,80 €	Patient bill	University Hospital (case of encephalitis in 2004)
Lactate dehydrogenases (LDH) (N = 1)	0,56 €	Patient bill	University Hospital (case of encephalitis in 2004)
Gammaglutaryltransferase (GGT) (N = 4)	2,24 €	Patient bill	University Hospital (case of encephalitis in 2004)
Alkaline phosphatase (N = 4)	2,24 €	Patient bill	University Hospital (case of encephalitis in 2004)
Creatin kinase isoenzymes (immunoassay) (N = 3)	5,25 €	Patient bill	University Hospital (case of encephalitis in 2004)
Troponin T isoform (immunoassay) (N = 3)	7,35 €	Patient bill	University Hospital (case of encephalitis in 2004)
Creatinin (N = 1)	0,49 €	Patient bill	University Hospital (case of encephalitis in 2004)
Creatinin clearance (N = 3)	4,20 €	Patient bill	University Hospital (case of encephalitis in 2004)
Angiotensin-converting enzyme (Kininase 2) (N = 1)	1,40 €	Patient bill	University Hospital (case of encephalitis in 2004)
Thyrotropic hormone (TSH) (N = 1)	1,75 €	Patient bill	University Hospital (case of encephalitis in 2004)
Free T4 (N = 1)	2,45 €	Patient bill	University Hospital (case of encephalitis in 2004)
Sodium - max 1 (N = 3)	1,68 €	Patient bill	University Hospital (case of encephalitis in 2004)
Antiepileptic drug (N = 5)	12,25 €	Patient bill	University Hospital (case of encephalitis in 2004)
Glucose (N = 10)	3,50 €	Patient bill	University Hospital (case of encephalitis in 2004)
Lactic acid (N = 7)	6,09 €	Patient bill	University Hospital (case of encephalitis in 2004)
Ionised calcium (N = 8)	16,80 €	Patient bill	University Hospital (case of encephalitis in 2004)
Torribod daloidir (it = 0)	10,00 €	i addit biil	Chirology (100phai (0000 of choophains III 2004)

Vitamine B12 and folic acid (non-isotopic assay) (N = 1)	2,80 €	Patient bill	University Hospital (case of encephalitis in 2004)
Red blood cell folate (non-isotopic assay) (N = 1)	2,10 €	Patient bill	University Hospital (case of encephalitis in 2004)
Iron (N = 1)	0,87 €	Patient bill	University Hospital (case of encephalitis in 2004)
Ferritin (non-isotopic assay) (N = 1)	1,75 €	Patient bill	University Hospital (case of encephalitis in 2004)
Transferrin (immunoassay)	0,87 €	Patient bill	University Hospital (case of encephalitis in 2004)
Blood pH, blood partial pressures of CO2 and O2 (including estimations of other parameters	14,00 €	Patient bill	University Hospital (case of encephalitis in 2004)
of acid-basis equilibrium (N = 8)			
Microscopic examination of sediment (with or without simple stain) (N = 1)	0,49 €	Patient bill	University Hospital (case of encephalitis in 2004)
Microscopic examination of sediment after double stain (N = 1)	0,63 €	Patient bill	University Hospital (case of encephalitis in 2004)
Aerobic culture of urine with identification of isolated pathogens (N = 1)	1,40 €	Patient bill	University Hospital (case of encephalitis in 2004)
Search of antinuclear or anticytoplasmic antibodies (immunofluorescence assay) (N = 1)	1,40 €	Patient bill	University Hospital (case of encephalitis in 2004)
Rheumatoid factor (N = 1)	0,70 €	Patient bill	University Hospital (case of encephalitis in 2004)
Circulating immune complexes (N = 1)	6,30 €	Patient bill	University Hospital (case of encephalitis in 2004)
D-dimers (latex assays or equivalent method) (N = 1)	1,40 €	Patient bill	University Hospital (case of encephalitis in 2004)
Anti-cardiolipin antibodies (N = 1)	1,40 €	Patient bill	University Hospital (case of encephalitis in 2004)
Anti-neutrophil cytoplasmic antibody (N = 1)	2,10 €	Patient bill	University Hospital (case of encephalitis in 2004)
Lupus anticoagulant (N = 1)	2,45 €	Patient bill	University Hospital (case of encephalitis in 2004)
C3 (immunoassay) (N = 1)	0,87 €	Patient bill	University Hospital (case of encephalitis in 2004)
C4 (immunoassay) (N = 1)	0,87 €	Patient bill	University Hospital (case of encephalitis in 2004)
IgG (immunoassay) (N = 1)	0,87 €	Patient bill	University Hospital (case of encephalitis in 2004)
IgA (immunoassay) (N = 1)	0,87 €	Patient bill	University Hospital (case of encephalitis in 2004)
IgM (immunoassay) (N = 1)	0,87 €	Patient bill	University Hospital (case of encephalitis in 2004)
Revealing of cryoglobulins (N = 1)	0,42 €	Patient bill	University Hospital (case of encephalitis in 2004)
Block fee (admission)	33,42 €	Patient bill	University Hospital (case of encephalitis in 2004)
Block fee for the accredited clinical laboratory specialist	27,01 €	Patient bill	University Hospital (case of encephalitis in 2004)
Medical and paramedical fees: non refundable laboratory analyses	7,51 €	Patient bill	University Hospital (case of encephalitis in 2004)
Neurology			, , ,
Lumbar puncture (N = 1)	10,70 €	Patient bill	University Hospital (case of encephalitis in 2004)
Electroencephalogram (N = 4)	238,52 €	Patient bill	University Hospital (case of encephalitis in 2004)
General anaesthetic or spinal block or continuous/non-continuous epidural (N = 1)	40,43 €	Patient bill	University Hospital (case of encephalitis in 2004)
Monitoring by a doctor registered as specialist in neurology (from Day 1 to Day 5)	43,68 €	Patient bill	University Hospital (case of encephalitis in 2004)
Monitoring by a doctor registered as specialist in neurology (from Day 6 to Day 12)	18,90 €	Patient bill	University Hospital (case of encephalitis in 2004)
Miscellaneous	.0,00 2		om one in the second of the se
Pure-tone or speech audiometry performed in a sound proof chamber (N = 1)	23,40 €	Patient bill	University Hospital (case of encephalitis in 2004)
Measurement of the eardrum, middle ear and ossicular chain impedance, with protocol and	12,76 €	Patient bill	University Hospital (case of encephalitis in 2004)
tympanogram, including the eventual acoustic reflex (N = 1)	12,70 €	i attorit biii	oniversity mospital (edge of chespitalitis in 2004)
Fee for examination by a specialised doctor of a patient hospitalised on demand of another	3,51 €	Patient bill	University Hospital (case of encephalitis in 2004)
recognized specialist (N = 1)	3,31 C	i adent biii	Oniversity Hospital (case of encephalitis in 2004)
Block fee for hospital medical permanence, after admission in an intensive care unit	35,70 €	Patient bill	University Hospital (case of encephalitis in 2004)
block fee for nospital medical permanence, after aumission in an intensive care unit	35,70 €	r atterit bili	Offiversity Hospital (case of effcephalitis in 2004)
Total costs of medical services per patient	1.519,00 €		
Total costs of medical services per patient	1.519,00 €		
Total costs for hagnitalization, nor nations, 2004 data	2 050 00 0		
Total costs for hospitalisation, per patient - 2004 data	2.859,00 €		
hospital stay + patient share + clinical lab + pharmaceutical fee	595,00 €		
pharmaceutical expenses per patient	745,00 €		
medical services per patient	1.519,00 €		
Total costs for hospitalisation, per patient - 2012 price indexing (WNND)	<b>3.553,00</b> € 3	•	http://www.plan.be/admin/uploaded/201005191119210.proj2010_fr.pdf
		indexing	
hospital stay + patient share + clinical lab + pharmaceutical fee	739,00 €		http://www.nbb.be/doc/DQ/F/DQ3/HISTO/NFDC12.PDF
pharmaceutical expenses per patient	926,00 €		

	medical services per patient	1.888,00 €
Total costs for hospitalisation, per patient -	2012 price indexing (AFP)	4.441,00 €

Total costs for hospitalisation of 869 patients (WNND+AFP)	23.346.714,00 €
Total costs for hospitalisation of 196 patients (AFP)	870.436,00 €
Total costs for hospitalisation of 6.326 patients (WNND)	22.476.278,00 €

## cost for homecare - during recovery (outpatient costs)

Duration of recovery at home (days) 30 scenario

cost per day for homecare (euro) - home health aides (nurse and caretaker) 78,00 €

nurse (two visits a day - one hour a day) 16,00 € 16,43 euros/heure http://www.inami.fgov.be/SiteCollectionDocuments/tarif\_infirmiers\_201201

caretaker (8 hours a day) 62,00 € 7,81 euros/heure (http://www.fasd.be/cct/tarifgardemalade/tarifgardemalade.asp

Total cost for the duration until recovery - home health aides 2.340,00 € calculation

nurse (two visits a day - one hour a day) 480,00 € calculation caretaker (8 hours a day) 1.860,00 € calculation

Total costs for 5,805 patients hospitalised and surviving 13.583.700,00 € calculation

## Compensations paid for the death of 717 patients (78 years old)

Compensation per person

9.800,00 € Belgian insurance company - compensation for the death of a 78 year old

person deceased in a road accident

Total compensations for the death of 717 patients 7.026.600,00 €

## Costs associated with work absenteiism for hospitalised patients (active persons,

occupied, aged between 15 and 64 years old)

Mer

Average monthly gross salary - 2012 (20 working days)

Employee 3.668,00 € 2012 projections Statbel, Belgian FPS Economy, S.M.E.s, Self-employed and Energy Worker 2.749,00 € 2012 projections Statbel, Belgian FPS Economy, S.M.E.s, Self-employed and Energy Self-employed 3.700,00 € 2009 data Statbel, Belgian FPS Economy, S.M.E.s, Self-employed and Energy

Average monthly gross salary - 2012 (30 working days)

Employee 5.502,00 €
Worker 4.124,00 €
Self-employed 5.550,00 €

Losses for the employer 1.736.234,00 € Employee (N = 187) 1.028.874,00 €

Workers (N = 115) 474.260,00 ∈ Self-employed (N = 42) 233.100,00 ∈

## Women

Average monthly gross salary - 2012 (20 working days)

Employee 3.372,00 € 2012 projections Statbel, Belgian FPS Economy, S.M.E.s, Self-employed and Energy Worker 2.527,00 € 2012 projections Statbel, Belgian FPS Economy, S.M.E.s, Self-employed and Energy Self-employed 3.413,00 € 2009 data Statbel, Belgian FPS Economy, S.M.E.s, Self-employed and Energy

Average monthly gross salary - 2012 (30 working days)

Employee	5.058,00 €
Worker	3.791,00 €
Self-employed	5.120,00 €

Losses for the employers		1.121.379,00 €
	Employee (N = 152)	768.816,00 €
	Workers (N = 93)	352.563,00 €
	Self-employed $(N = 19)$	66.560,00 €

Total losses associated with work absenteiism (hospitalised cases) (N = 587) 2.857.613,0
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	SUMMARY OF	COSTS ASSOCIATED WITH WNV EPIDEMICS I	N HUMANS
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Cost of consultations of the GP (N = 6.522)
Cost of diagnosis for 6.522 hospitalised patients
Cost of hospitalisation for 6.326 hospitalised patients WNND
Cost of hospitalisation for 196 hospitalised patients AFP

Cost of homecare (nurse, caretaker and housekeeper) for 5.805 surviving patients

Total compensations for the death of 717 patients

Total losses associated with work absenteiism (hospitalised cases) (N = 587)

150.006,00 €

136.962,00 €

22.476.278,00 €

870.436,00 €

13.583.700,00 €

7.026.600,00 €

2.857.613,00 €

TOTAL 47.101.595,00 €