

1. NAME OF THE MEDICINAL PRODUCT

Pandemrix suspension and emulsion for emulsion for injection.
Pandemic influenza vaccine (H1N1)v (split virion, inactivated, adjuvanted)

2. QUALITATIVE AND QUANTITATIVE COMPOSITION

After mixing, 1 dose (0.5 ml) contains:

Split influenza virus, inactivated, containing antigen* equivalent to:

A/California/7/2009 (H1N1)v-like strain (X-179A) 3.75 micrograms**

* propagated in eggs

** haemagglutinin

This vaccine complies with the WHO recommendation and EU decision for the pandemic.

AS03 adjuvant composed of squalene (10.69 milligrams), DL- α -tocopherol (11.86 milligrams) and polysorbate 80 (4.86 milligrams)

The suspension and emulsion, once mixed, form a multidose vaccine in a vial. See section 6.5 for the number of doses per vial.

Excipients: the vaccine contains 5 micrograms thiomersal

For a full list of excipients see section 6.1.

3. PHARMACEUTICAL FORM

Suspension and emulsion for emulsion for injection.
The suspension is a colourless light opalescent liquid.
The emulsion is a whitish homogeneous liquid.

4. CLINICAL PARTICULARS

4.1 Therapeutic indications

Prophylaxis of influenza in an officially declared pandemic situation (see sections 4.2 and 5.1).

Pandemic influenza vaccine should be used in accordance with Official Guidance.

4.2 Posology and method of administration

This pandemic influenza vaccine has been authorised based on data obtained with a version containing H5N1 antigen supplemented with data obtained with a vaccine containing H1N1 antigen. The Clinical Particulars section will be updated in accordance with emerging additional data.

There is currently very limited clinical experience with an investigational formulation of Pandemrix (H1N1) containing a higher amount of antigen (see section 5.1) in healthy adults aged 18-60 years and no clinical experience in the elderly, in children or in adolescents. The decision to use Pandemrix (H1N1) in each age group defined below should take into account the extent of the clinical data available with a version of the vaccine containing H5N1 antigen and the disease characteristics of the current influenza pandemic.

The dose recommendations are based on:

- safety and immunogenicity data available on the administration of AS03-adjuvanted vaccine containing 3.75 µg HA derived from A/Vietnam/1194/2004 (H5N1) at 0 and 21 days to adults, including the elderly, and on the administration of the adult dose and half of the adult dose at 0 and 21 days to children aged from 3-9 years
- very limited immunogenicity data obtained three weeks after administration of a single dose of an investigational formulation of Pandemrix (H1N1) to healthy adults aged 18-60 years.

See sections 4.8 and 5.1.

Posology

Adults aged 18-60 years:

One dose of 0.5 ml at an elected date.

A second dose of vaccine should preferably be given. There should be an interval of at least three weeks between the first and second dose.

However, preliminary immunogenicity data obtained at three weeks after administration of an investigational formulation of Pandemrix (H1N1) to a limited number of healthy adults aged 18-60 years suggest that a single dose may be sufficient in this age group. See section 5.1.

Elderly (>60 years)

One dose of 0.5 ml at an elected date.

A second dose of vaccine should be given after an interval of at least three weeks. See section 5.1.

Children and adolescents aged 10-17 years

If vaccination is considered to be necessary, consideration may be given to dosing in accordance with the recommendations for adults. However, the choice of dose for this age group should take into account the available data on safety and immunogenicity in adults and in children aged from 3-9 years. See sections 4.8 and 5.1.

Children aged 3-9 years

If vaccination is considered to be necessary, the available data suggest that administration of 0.25 ml of vaccine (i.e. half of the adult dose) at an elected date and a second dose administered at least three weeks later may be sufficient.

There are very limited safety and immunogenicity data available on the administration of AS03-adjuvanted vaccine containing 3.75 µg HA derived from A/Vietnam/1194/2004 (H5N1) and on administration of half a dose of the same vaccine (i.e. 1.875 µg HA and half the amount of AS03 adjuvant in 0.25 ml) at 0 and 21 days in this age group.

See sections 4.8 and 5.1.

Children aged from 6 months to 3 years

If vaccination is considered to be necessary, consideration may be given to dosing in accordance with the recommendation in children aged 3-9 years. See sections 4.8 and 5.1.

Children aged less than 6 months

Vaccination is not currently recommended in this age group.

For further information, see sections 4.4, 4.8 and 5.1.

It is recommended that subjects who receive a first dose of Pandemrix, complete the vaccination course with Pandemrix (see section 4.4).

Method of administration

Immunisation should be carried out by intramuscular injection preferably into the deltoid muscle or anterolateral thigh (depending on the muscle mass).

4.3 Contraindications

History of an anaphylactic (i.e. life-threatening) reaction to any of the constituents or trace residues (egg and chicken protein, ovalbumin, formaldehyde, gentamicin sulphate and sodium deoxycholate) of this vaccine. If vaccination is considered to be necessary, facilities for resuscitation should be immediately available in case of need.

See section 4.4 for Special warnings and special precautions for use.

4.4 Special warnings and precautions for use

Caution is needed when administering this vaccine to persons with a known hypersensitivity (other than anaphylactic reaction) to the active substance, to any of the excipients, to thiomersal and to residues (egg and chicken protein, ovalbumin, formaldehyde, gentamicin sulphate and sodium deoxycholate).

As with all injectable vaccines, appropriate medical treatment and supervision should always be readily available in case of a rare anaphylactic event following the administration of the vaccine.

If the pandemic situation allows, immunisation shall be postponed in patients with severe febrile illness or acute infection.

Pandemrix should under no circumstances be administered intravascularly.

There are no data with Pandemrix using the subcutaneous route. Therefore, healthcare providers need to assess the benefits and potential risks of administering the vaccine in individuals with thrombocytopenia or any bleeding disorder that would contraindicate intramuscular injection unless the potential benefit outweighs the risk of bleedings.

There are no data on administration of AS03-adjuvanted vaccines before or following other types of influenza vaccines intended for pre-pandemic or pandemic use.

Antibody response in patients with endogenous or iatrogenic immunosuppression may be insufficient.

A protective immune response may not be elicited in all vaccinees (see section 5.1).

There is very limited experience in children between 3 and 9 years of age and no experience in children less than 3 years of age or in children and adolescents between 10 and 17 years. See sections 4.2, 4.8 and 5.1.

There are no safety, immunogenicity or efficacy data to support interchangeability of Pandemrix with other H1N1 pandemic vaccines.

4.5 Interaction with other medicinal products and other forms of interaction

There are no data on co-administration of Pandemrix with other vaccines.

However, if co-administration with another vaccine is considered, immunisation should be carried out on separate limbs. It should be noted that the adverse reactions may be intensified.

The immunological response may be diminished if the patient is undergoing immunosuppressant treatment.

Following influenza vaccination, false-positive serology test results may be obtained by the ELISA method for antibody to human immunodeficiency virus-1 (HIV-1), hepatitis C virus and, especially,

HTLV-1. In such cases, the Western blot method is negative. These transitory false-positive results may be due to IgM production in response to the vaccine.

4.6 Pregnancy and lactation

There are currently no data available on the use of Pandemrix in pregnancy. Data from pregnant women vaccinated with different inactivated non-adjuvanted seasonal vaccines do not suggest malformations or fetal or neonatal toxicity.

Animal studies with Pandemrix do not indicate reproductive toxicity (see section 5.3).

The use of Pandemrix may be considered during pregnancy if this is thought to be necessary, taking into account official recommendations.

Pandemrix may be used in lactating women.

4.7 Effects on ability to drive and use machines

Some of the effects mentioned under section 4.8 “Undesirable Effects” may affect the ability to drive or use machines.

4.8 Undesirable effects

- Clinical trials

Adverse reactions from clinical trials with the mock-up vaccine are listed here below (see section 5.1 for more information on mock-up vaccines).

Adults

Clinical studies have evaluated the incidence of adverse reactions listed below in approximately 5,000 subjects 18 years old and above who received formulations containing A/Vietnam/1194/2004 (H5N1) strain with at least 3.75 microgram HA/AS03.

Adverse reactions reported are listed according to the following frequency:

Very common ($\geq 1/10$)

Common ($\geq 1/100$ to $< 1/10$)

Uncommon ($\geq 1/1,000$ to $< 1/100$)

Rare ($\geq 1/10,000$ to $< 1/1,000$)

Very rare ($< 1/10,000$)

Within each frequency grouping, undesirable effects are presented in order of decreasing seriousness.

Blood and lymphatic system disorders

Common: lymphadenopathy

Psychiatric disorders

Uncommon: insomnia

Nervous system disorders

Very common: headache

Uncommon: paraesthesia, somnolence, dizziness

Gastrointestinal disorders

Uncommon: gastro-intestinal symptoms (such as diarrhoea, vomiting, abdominal pain, nausea)

Skin and subcutaneous tissue disorders

Common: ecchymosis at the injection site, sweating increased

Uncommon: pruritus, rash

Musculoskeletal and connective tissue disorders

Very common: arthralgia, myalgia

General disorders and administration site conditions

Very common: induration, swelling, pain and redness at the injection site, fever, fatigue

Common: shivering, influenza like illness, injection site reactions (such as warmth, pruritus)

Uncommon: malaise

Children aged 3-9 years

A clinical study evaluated the reactogenicity in children 3 to 5 and 6 to 9 years of age who received either a full or a half dose of AS03-adjuvanted vaccine containing 3.75 µg HA derived from A/Vietnam/1194/2004 (H5N1).

The per-dose frequency of adverse reactions observed in the groups of children who received a full dose of AS03-adjuvanted vaccine containing 3.75 µg HA derived from A/Vietnam/1194/2004 (H5N1) was higher than that observed in the groups of children who received half of the dose, except for redness in the 6-9 years of age group. The per-dose frequency of the following adverse reactions was as follows:

Adverse reactions	3-5 years		6-9 years	
	Half dose	Full dose	Half dose	Full dose
Induration	9.9%	18.6%	12.0%	12.2%
Pain	48.5%	62.9%	68.0%	73.5%
Redness	10.9%	19.6%	13.0%	6.1%
Swelling	11.9%	24.7%	14.0%	20.4%
Fever (>38°C)	2.0%	6.2%	2.0%	10.2%
Fever (>39°C)				
- per-dose frequency	2.0%	5.2%	0%	7.1%
- per-subject frequency	3.9%	10.2%	0%	14.3%
Drowsiness	7.9%	13.4%	NA	NA
Irritability	7.9%	18.6%	NA	NA
Loss of appetite	6.9%	16.5%	NA	NA
Shivering	1.0%	12.4%	4.0%	14.3%

NA=not available

• Post-marketing surveillance

From Post-marketing surveillance with interpandemic trivalent vaccines, the following adverse reactions have been reported:

Uncommon:

Generalised skin reactions including urticaria

Rare:

Neuralgia, convulsions, transient thrombocytopenia.

Allergic reactions, in rare cases leading to shock, have been reported.

Very rare:

Vasculitis with transient renal involvement.

Neurological disorders, such as encephalomyelitis, neuritis and Guillain Barré syndrome.

This medicinal product contains thiomersal (an organomercuric compound) as a preservative and therefore, it is possible that sensitisation reactions may occur (see section 4.4).

4.9 Overdose

No case of overdose has been reported.

5. PHARMACOLOGICAL PROPERTIES

5.1 Pharmacodynamic properties

Pharmacotherapeutic group: Influenza vaccines, ATC Code J07BB02.

This medicinal product has been authorised under “Exceptional Circumstances”. The European Medicines Agency (EMA) will regularly review any new information which may become available and this SPC will be updated as necessary.

This section describes the clinical experience with the mock-up vaccines following a two-dose administration and with an investigational formulation of Pandemrix (H1N1) after a single dose in healthy adults aged 18-60 years.

Mock-up vaccines contain influenza antigens that are different from those in the currently circulating influenza viruses. These antigens can be considered as “novel” antigens and simulate a situation where the target population for vaccination is immunologically naïve. Data obtained with the mock-up vaccine will support a vaccination strategy that is likely to be used for the pandemic vaccine: clinical immunogenicity, safety and reactogenicity data obtained with mock-up vaccines are relevant for the pandemic vaccines.

Clinical studies have evaluated the immunogenicity of different formulations of AS03-adjuvanted and non-adjuvanted vaccines (A/H5N1) in subjects aged 3-9 years, 18-60 years and >60 years following a 0, 21 day schedule. The majority of these subjects had no detectable anti-haemagglutinin (anti-HA) antibody to the H5N1 strains tested before vaccination.

Immune response to an investigational formulation of Pandemrix (H1N1) in adults aged 18-60 years

In a clinical study that evaluated the immunogenicity of AS03-adjuvanted vaccine containing 5.25 µg HA derived from A/California/7/2009 (H1N1)v-like in healthy subjects aged 18-60 years the anti-HA antibody responses were as follows:

anti-HA antibody	Immune response to A/California/7/2009 (H1N1)v-like
	21 days after 1st dose N=62
Seroprotection rate ¹	98.4%
Seroconversion rate ²	98.4%
Seroconversion factor ³	41.4

¹ seroprotection rate: proportion of subjects with haemagglutination inhibition (HI) titre $\geq 1:40$;

² seroconversion rate: proportion of subjects who were either seronegative at pre-vaccination and have a protective post-vaccination titre of $\geq 1:40$, or who were seropositive at pre-vaccination and have a 4-fold increase in titre;

³ seroconversion factor: ratio of the post-vaccination geometric mean titre (GMT) and the pre-vaccination GMT.

Immune response against A/Vietnam/1194/2004 (H5N1):

Adults aged 18-60 years

In clinical studies that evaluated the immunogenicity of AS03-adjuvanted vaccine containing 3.75 µg HA derived from A/Vietnam/1194/2004 the anti-HA antibody responses were as follows:

anti-HA antibody	Immune response to A/Vietnam/1194/2004				
	0, 21 days schedule		0, 6 months schedule		
	21 days after 1 st dose N=925	21 days after 2 nd dose N=924	21 days after 1 st dose N=55	7 days after 2 nd dose N=47	21 days after 2 nd dose N=48
Seroprotection rate ¹	44.5%	94.3%	38.2%	89.4%	89.6%
Seroconversion rate ²	42.5%	93.7%	38.2%	89.4%	89.6%
Seroconversion factor ³	4.1	39.8	3.1	38.2	54.2

¹ seroprotection rate: proportion of subjects with haemagglutination inhibition (HI) titre $\geq 1:40$;

² seroconversion rate: proportion of subjects who were either seronegative at pre-vaccination and have a protective post-vaccination titre of $\geq 1:40$, or who were seropositive at pre-vaccination and have a 4-fold increase in titre;

³ seroconversion factor: ratio of the post-vaccination geometric mean titre (GMT) and the pre-vaccination GMT.

After two doses given 21 days or 6 months apart, 96.0% of subjects had a 4-fold increase in serum neutralising antibody titres and 98-100% had a titre of at least 1:80.

Follow up of 50 subjects who had received two doses of AS03-adjuvanted vaccine containing 3.75 µg HA derived from A/Vietnam/1194/2004 at 0 and 21 days showed that 84% were seroprotected (HI titre $\geq 1:40$) at day 42 compared with 54% at day 180. A 4-fold increase in serum neutralising antibody titres from day 0 was observed in 85.7% at day 42 and 72% at day 180.

Elderly (>60 years)

In another clinical study, 152 subjects aged > 60 years (stratified in ranges from 61 to 70, 71 to 80 and > 80 years of age) received either a single or a double dose of AS03-adjuvanted vaccine containing 3.75 µg HA derived from A/Vietnam/1194/2004 (H5N1) at 0 and 21 days. At day 42, the anti-HA antibody responses were as follows:

anti-HA antibody	Immune response to A/Vietnam/1194/2004 (D42)					
	61 to 70 years		71 to 80 years		>80 years	
	Single dose N=91	Double dose N=92	Single dose N=48	Double dose N=43	Single dose N=13	Double dose N=10
Seroprotection rate ¹	84.6%	97.8%	87.5%	93.0%	61.5%	90.0%
Seroconversion rate ²	74.7%	90.2%	77.1%	93.0%	38.5%	50.0%
Seroconversion factor ³	11.8	26.5	13.7	22.4	3.8	7.7

¹ seroprotection rate: proportion of subjects with haemagglutination inhibition (HI) titre $\geq 1:40$;

² seroconversion rate: proportion of subjects who were either seronegative at pre-vaccination and have a protective post-vaccination titre of $\geq 1:40$, or who were seropositive at pre-vaccination and have a 4-fold increase in titre;

³ seroconversion factor: ratio of the post-vaccination geometric mean titre (GMT) and the pre-vaccination GMT.

Although an adequate immune response was achieved at day 42 following two administrations of a single dose of AS03-adjuvanted vaccine containing 3.75 µg HA derived from A/Vietnam/1194/2004 (H5N1), a higher response was observed following two administrations of a double dose of vaccine.

Very limited data in seronegative subjects >80 years of age (N=5) showed that no subject achieved seroprotection following two administrations of a single dose of AS03-adjuvanted vaccine containing 3.75 µg HA derived from A/Vietnam/1194/2004 (H5N1). However, following two administrations of a double dose of vaccine, the seroprotection rate at day 42 was 75%.

The day 180 seroprotection rates in subjects aged >60 years were 52.9% for those who had received two single doses and 69.5% for those who had received two double doses at day 0 and day 21.

In addition, 44.8% and 56.1% of subjects in respective dose groups had a 4-fold increase in serum neutralising antibody titres from day 0 to day 42 and 96.6% and 100% of subjects had a titre of at least 1:80 at day 42.

Children aged 3 to 9 years

In another clinical study, children aged 3 to 5 and 6 to 9 years old received two doses of either a full (0.5 ml) or a half dose (0.25 ml) of AS03-adjuvanted vaccine containing 3.75 µg HA derived from A/Vietnam/1194/2004 (H5N1) at 0 and 21 days. At day 42 and six months after the second dose, the anti-HA antibody responses were as follows:

anti-HA antibody	Immune response to A/Vietnam/1194/2004							
	3 to 5 years				6 to 9 years			
	Day 42		Day 180		Day 42		Day 180	
	Half dose N=49	Full dose N=44	Half dose N=50	Full dose N=29	Half dose N=43	Full dose N=43	Half dose N=44	Full dose N=41
Seroprotection rate ¹	95.9%	100%	56.0%	82.8%	100%	100%	63.6%	78%
Seroconversion rate ²	95.9%	100%	56.0%	82.8%	100%	100%	61.0%	78%
Seroconversion factor ³	78.5	191.3	5.9	16	108.1	176.7	6.1	12.3

¹seroprotection rate: proportion of subjects with haemagglutination inhibition (HI) titre $\geq 1:40$;

²seroconversion rate: proportion of subjects who were either seronegative at pre-vaccination and have a protective post-vaccination titre of $\geq 1:40$, or who were seropositive at pre-vaccination and have a 4-fold increase in titre;

³seroconversion factor: ratio of the post-vaccination geometric mean titre (GMT) and the pre-vaccination GMT.

The clinical relevance of the haemagglutination inhibition (HI) titre $\geq 1:40$ in children is unknown.

At day 42, the neutralising antibody responses were as follows:

Serum neutralising antibody	Immune response to A/Vietnam/1194/2004			
	21 days after 2 nd dose			
	3 to 5 years		6 to 9 years	
	Half dose N=47	Full dose N=42	Half dose N=42	Full dose N=42
GMT ¹	1044.4	4578.3	1155.1	3032.5
Seroconversion rate ²	95.6%	97.4%	100%	100%

$\geq 1:80^3$	100%	100%	100%	100%
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¹Geometric Mean Titre

²4-fold increase in serum neutralising antibody titre

³% of subjects reaching a serum neutralising antibody titre of at least 1:80

Immune response against A/Indonesia/05/2005 (H5N1)

In a clinical study in which two doses of AS03-adjuvanted vaccine containing 3.75 µg HA derived from A/Indonesia/05/2005 were administered on days 0 and 21 to 140 subjects aged 18-60 years, the anti-HA antibody responses were as follows:

anti-HA antibody	Immune response to A/Indonesia/05/2005		
	Day 21 N=140	Day 42 N=140	Day 180 N=138
Seroprotection rate ¹	45.7%	96.4%	49.3%
Seroconversion rate ²	45.7%	96.4%	48.6%
Seroconversion factor ³	4.7	95.3	5.2

¹seroprotection rate: proportion of subjects with haemagglutination inhibition (HI) titre $\geq 1:40$;

²seroconversion rate: proportion of subjects who were either seronegative at pre-vaccination and have a protective post-vaccination titre of $\geq 1:40$, or who were seropositive at pre-vaccination and have a 4-fold increase in titre;

³seroconversion factor: ratio of the post-vaccination geometric mean titre (GMT) and the pre-vaccination GMT.

A 4-fold increase in serum neutralising antibody titres was observed in 79.2% of subjects twenty-one days after the first dose, 95.8% twenty-one days after the second dose and 87.5% six months after the second dose.

In a second study, 49 subjects aged 18-60 years received two doses of AS03-adjuvanted vaccine containing 3.75 µg HA derived from A/Indonesia/05/2005 on days 0 and 21. At day 42, the anti-HA antibody seroconversion rate was 98%, all subjects were seroprotected and the seroconversion factor was 88.6. In addition, all subjects had neutralising antibody titres of at least 1:80.

Cross-reactive immune responses elicited by AS03-adjuvanted vaccine containing 3.75 µg HA derived from A/Vietnam/1194/2004 (H5N1):

Adults aged 18-60 years

Anti-HA responses against A/Indonesia/5/2005 following administration of AS03-adjuvanted vaccine containing 3.75 µg HA derived from A/Vietnam/1194/2004 were as follows:

anti-HA antibody	A/Indonesia/5/2005		
	0, 21 days schedule 21 days after 2 nd dose N = 924	0, 6 months schedule 7 days after 2 nd dose N = 47	
Seroprotection rate ¹	50.2%	74.5%	83.3%
Seroconversion rate ²	50.2%	74.5%	83.3%
Seroconversion factor ³	4.9	12.9	18.5

¹seroprotection rate: proportion of subjects with haemagglutination inhibition (HI) titre $\geq 1:40$;

²seroconversion rate: proportion of subjects who were either seronegative at pre-vaccination and have a protective post-vaccination titre of $\geq 1:40$, or who were seropositive at pre-vaccination and have a 4-fold increase in titre;

³seroconversion factor: ratio of the post-vaccination geometric mean titre (GMT) and the pre-vaccination GMT.

A 4-fold increase in serum neutralising antibody against A/Indonesia/5/2005 was achieved in >90% of subjects after two doses regardless of the schedule. After two doses administered 6 months apart all subjects had a titre of at least 1:80.

In a different study in 50 subjects the anti-HA antibody seroprotection rates 21 days after the second dose of AS03-adjuvanted vaccine containing 3.75 µg HA derived from A/Vietnam/1194/2004 were 20% against A/Indonesia/5/2005, 35% against A/Anhui/01/2005 and 60% against A/Turkey/Turkey/1/2005.

Elderly (>60 years)

In 152 subjects aged > 60 years the anti-HA antibody seroprotection and seroconversion rates against A/Indonesia/5/2005 at day 42 after two doses of AS03-adjuvanted vaccine containing 3.75 µg HA derived from A/Vietnam/1194/2004 were 23% and the seroconversion factor was 2.7. Neutralising antibody titres of at least 1:40 or at least 1:80 were achieved in 87% and 67%, respectively, of the 87 subjects tested.

Children aged 3 to 9 years

In the subjects aged 3 to 5 and 6 to 9 years old who received two doses of either a full or a half dose of AS03-adjuvanted vaccine containing 3.75 µg HA derived from A/Vietnam/1194/2004 (H5N1), the anti-HA antibody responses at day 42 (N=179) and six months after the second dose (N=164) were as follows:

anti-HA antibody	Immune response to A/Indonesia/5/2005							
	3 to 5 years				6 to 9 years			
	Day 42		Day 180		Day 42		Day 180	
	Half dose N=49	Full dose N=44	Half dose N=50	Full dose N=29	Half dose N=43	Full dose N=43	Half dose N=44	Full dose N=41
Seroprotection rate ¹	71.4%	95.5%	6.0%	69.0%	74.4%	79.1%	4.5%	61.0%
Seroconversion rate ²	71.4%	95.5%	6.0%	69.0%	74.4%	79.1%	2.4%	61.0%
Seroconversion factor ³	10.7	33.6	1.4	8.5	12.2	18.5	1.2	7.4

¹seroprotection rate: proportion of subjects with haemagglutination inhibition (HI) titre \geq 1:40;

²seroconversion rate: proportion of subjects who were either seronegative at pre-vaccination and have a protective post-vaccination titre of \geq 1:40, or who were seropositive at pre-vaccination and have a 4-fold increase in titre;

³seroconversion factor: ratio of the post-vaccination geometric mean titre (GMT) and the pre-vaccination GMT.

Furthermore, in the group of children that received a half dose of vaccine, the rate of subjects with a titre of neutralising antibodies above 1:80 remained high up to 12 months after the first dose: in the 3-5 years old group, 97.8% at day 42, 89.6% at month 6 and 87.2% at month 12 and in the 6-9 years old group, 97.6% at day 42, 90.0% at month 6 and 82.9% at month 12.

One dose of AS03-adjuvanted vaccine containing 3.75 µg HA derived from A/Indonesia/05/2005 administered after one or two doses of AS03-adjuvanted vaccine containing 3.75 µg HA derived from A/Vietnam/1194/2004.

In a clinical study, subjects aged 18-60 years received a dose of AS03-adjuvanted vaccine containing 3.75 µg HA derived from either A/Vietnam/1194/2004 or Indonesia/5/2005 six months after they had

received one or two priming doses of AS03-adjuvanted vaccine containing 3.75 µg HA derived from A/Vietnam/1194/2004 on day 0 or on days 0 and 21 respectively. The anti-HA responses were as follows:

anti-HA antibody	Against A/Vietnam 21 days after boosting with A/Vietnam N=46		Against A/Indonesia 21 days after boosting with A/Indonesia N=49	
	After one priming dose	After two priming doses	After one priming dose	After two priming doses
Seroprotection rate ¹	89.6%	91.3%	98.1%	93.9%
Booster seroconversion rate ²	87.5%	82.6%	98.1%	91.8%
Booster factor ³	29.2	11.5	55.3	45.6

¹ seroprotection rate: proportion of subjects with haemagglutination inhibition (HI) titre $\geq 1:40$;

² booster seroconversion rate: proportion of subjects who were either seronegative at pre-booster and have a protective post-vaccination titre of $\geq 1:40$, or who were seropositive at pre-booster and have a 4-fold increase in titre;

³ booster factor: ratio of the post-booster geometric mean titre (GMT) and the pre-booster GMT.

Regardless of whether one or two doses of priming vaccine had been given 6 months earlier, the seroprotection rates against A/Indonesia were $>80\%$ after a dose of AS03-adjuvanted vaccine containing 3.75 µg HA derived from A/Vietnam/1194/2004 and the seroprotection rates against A/Vietnam were $>90\%$ after a dose of AS03-adjuvanted vaccine containing 3.75 µg HA derived from A/Indonesia/05/2005. All subjects achieved a neutralising antibody titre of at least 1:80 against each of the two strains regardless of the HA type in the vaccine and the previous number of doses.

In another clinical study, 39 subjects aged 18-60 years received a dose of AS03-adjuvanted vaccine containing 3.75 µg HA derived from A/Indonesia/5/2005 fourteen months after they had received two doses of AS03-adjuvanted vaccine containing 3.75 µg HA derived from A/Vietnam/1194/2004 administered on day 0 and day 21. The seroprotection rate against A/Indonesia 21 days after booster vaccination was 92% and 69.2% at day 180.

Information from non-clinical studies:

The ability to induce protection against homologous and heterologous vaccine strains was assessed non-clinically using ferret challenge models.

In each experiment, four groups of six ferrets were immunized intramuscularly with an AS03 adjuvanted vaccine containing HA derived from H5N1/A/Vietnam/1194/04 (NIBRG-14). Doses of 15, 5, 1.7 or 0.6 micrograms of HA were tested in the homologous challenge experiment, and doses of 15, 7.5, 3.8 or 1.75 micrograms of HA were tested in the heterologous challenge experiment. Control groups included ferrets immunized with adjuvant alone, non-adjuvanted vaccine (15 micrograms HA) or phosphate buffered saline solution. Ferrets were vaccinated on days 0 and 21 and challenged by the intra-tracheal route on day 49 with a lethal dose of either H5N1/A/Vietnam/1194/04 or heterologous H5N1/A/Indonesia/5/05. Of the animals receiving adjuvanted vaccine, 87% and 96% were protected against the lethal homologous or heterologous challenge, respectively. Viral shedding into the upper respiratory tract was also reduced in vaccinated animals relative to controls, suggesting a reduced risk of viral transmission. In the unadjuvanted control group, as well as in the adjuvant control group, all animals died or had to be euthanized as they were moribund, three to four days after the start of challenge.

5.2 Pharmacokinetic properties

Not applicable.

5.3 Preclinical safety data

Non-clinical data obtained with the mock-up vaccine using a H5N1 vaccine strain reveal no special hazard for humans based on conventional studies of safety pharmacology, acute and repeated dose toxicity, local tolerance, female fertility, embryo-fetal and postnatal toxicity (up to the end of the lactation period).

6. PHARMACEUTICAL PARTICULARS

6.1 List of excipients

Suspension vial:

Polysorbate 80

Octoxynol 10

Thiomersal

Sodium chloride (NaCl)

Disodium hydrogen phosphate (Na_2HPO_4)

Potassium dihydrogen phosphate (KH_2PO_4)

Potassium chloride (KCl)

Magnesium chloride (MgCl_2)

Water for injections

Emulsion vial:

Sodium chloride (NaCl)

Disodium hydrogen phosphate (Na_2HPO_4)

Potassium dihydrogen phosphate (KH_2PO_4)

Potassium chloride (KCl)

Water for injections

For adjuvants, see section 2.

6.2 Incompatibilities

In the absence of compatibility studies, this medicinal product must not be mixed with other medicinal products.

6.3 Shelf-life

2 years.

After mixing, the vaccine should be used within 24 hours. Chemical and physical in-use stability has been demonstrated for 24 hours at 25°C.

6.4 Special precautions for storage

Store in a refrigerator (2°C – 8°C).

Do not freeze.

Store in the original package in order to protect from light.

6.5 Nature and contents of container

One pack containing:

- one pack of 50 vials (type I glass) of 2.5 ml suspension (10 x 0.25 ml doses) with a stopper (butyl rubber).
- two packs of 25 vials (type I glass) of 2.5 ml emulsion (10 x 0.25 ml doses) with a stopper (butyl rubber).

The volume after mixing 1 vial of suspension (2.5 ml) with 1 vial of emulsion (2.5 ml) corresponds to 10 doses of vaccine (5 ml).

6.6 Special precautions for disposal and other handling

Pandemrix consists of two containers:

Suspension: multidose vial containing the antigen,

Emulsion: multidose vial containing the adjuvant.

Prior to administration, the two components should be mixed.

Instructions for mixing and administration of the vaccine:

1. Before mixing the two components, the emulsion and suspension should be allowed to reach room temperature, shaken and inspected visually for any foreign particulate matter and/or abnormal physical appearance. In the event of either being observed, discard the vaccine.
2. The vaccine is mixed by withdrawing the contents of the vial containing the emulsion by means of a syringe and by adding it to the vial containing the suspension.
3. After the addition of the emulsion to the suspension, the mixture should be well shaken. The mixed vaccine is a whitish emulsion. In the event of other variation being observed, discard the vaccine.
4. The volume of Pandemrix (5 ml) after mixing corresponds to 10 doses of vaccine.
5. The vial should be shaken prior to each administration.
6. Each vaccine dose of 0.5 ml is withdrawn into a syringe for injection.
7. The needle used for withdrawal must be replaced by a needle suitable for intramuscular injection.
8. After mixing, use the vaccine within 24 hours and do not store above 25°C.

Any unused product or waste material should be disposed of in accordance with local requirements.

7. MARKETING AUTHORISATION HOLDER

GlaxoSmithKline Biologicals s.a.

rue de l'Institut 89

B-1330 Rixensart, Belgium

8. MARKETING AUTHORISATION NUMBER(S)

EU/1/08/452/001

9. DATE OF FIRST AUTHORISATION/RENEWAL OF THE AUTHORISATION

Date of first authorisation: 20/05/2008

10. DATE OF REVISION OF THE TEXT

Detailed information on this medicinal product is available on the website of the European Medicines Agency (EMA) <http://www.ema.europa.eu/>.